RCS 03-180

EGLIN AIR FORCE BASE
Florida

B61 JOINT TEST ASSEMBLY (JTA) WEAPONS SYSTEMS EVALUATION PROGRAM (WSEP) EGLIN AIR FORCE BASE, FL

FINAL ENVIRONMENTAL ASSESSMENT

June 2004

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FINDING OF NO SIGNIFICANT IMPACT

FOR

B61 Joint Test Assembly (JTA) Weapons Systems Evaluation Program
EGLIN AFB, FLORIDA
RCS 03-180

Pursuant to the President's Council on Environmental Quality regulations for implementing the procedural provisions of the National Environmental Policy Act (40 Code of Federal Regulations 1500-1508), 32 CFR Part 989, and Department of Defense Directive 6050.1, the Department of the Air Force has conducted an Environmental Assessment (EA) of the probable environmental consequences for the B61 JTA WSEP at Eglin AFB, Florida.

DESCRIPTION OF PROPOSED ACTION

Proposed Action (Alternative 1): Air Combat Command has requested the use of Eglin Air Force Base as an alternative to the Department of Energy's (DOE) Tonopah Test Range (TTR) for conducting B61 Joint Test Assembly (JTA) Weapons Systems Evaluation Program (WSEP) flight tests. These flights are part of the DOE and Department of Defense (DoD) surveillance testing of the enduring stockpile and not a test of new weapons or weapon components. The purpose of the B61 flight test program is to test the B61 JTA in normal "stockpile-to-target sequence" (STS). Environmental conditions at Eglin will allow for testing at higher humidity levels and lower target altitudes. The goal for the test is high-speed, low and high altitude release on Test Area (TA) B-70. The desired target will be a 90,000 square foot (300' x 300') concrete pad constructed on TA B-70. Additional testing would include a shallow water drop in the Gulf of Mexico (W151 in $\leq$50 foot depth). WSEPs would include B-52, B-2, F-15E, or F-16C aircraft dropping B61 JTAs, with each test employing a "drop/watch/retrieve" sequence. The JTAs would be immediately removed after each test. A B61 test event would occur approximately every two years beginning in 2004. A test event would include the release of one to two JTAs at the selected TA.

FINDING OF NO SIGNIFICANT IMPACT

Based on my review of the facts and the Environmental Assessment, I conclude that the proposed B61 JTA WSEP at Eglin AFB, Florida, will not have a significant adverse impact of a long-term nature to the quality of the human or natural environment. This analysis fulfills the requirements of the National Environmental Policy Act, the President's Council on Environmental Quality regulations, and 32 CFR 989. Therefore, an environmental impact statement is not required and will not be prepared.

23 JUN 2004

JAMES D. SIRMANS, GS-15
Director, Environmental Management

B61 JOINT TEST ASSEMBLY (JTA) WEAPONS SYSTEMS EVALUATION PROGRAM (WSEP) EGLIN AIR FORCE BASE, FL

FINAL ENVIRONMENTAL ASSESSMENT

Submitted to:

AAC/EMSP
Environmental Management Directorate, Stewardship Division,
Environmental Analysis Branch
Eglin Air Force Base, FL 32542-6808

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June 2004

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LIST OF ACRONYMS, ABBREVIATIONS, AND SYMBOLS

46 OG/OGP	46th Operations Group, Special Operations Division
46 JRS/DOP	46th Joint Range Squadron, Special Projects Flight
96 AMDS/SGPB/SGPBR	96th Bioenvironmental Engineering Flight
96 CEG/CESX	96th Civil Engineering, Readiness Flight
AAC	Air Armament Center
AAC/EMCE	Environmental Management Directorate, Environmental Compliance Division, Environmental Engineering Branch
AAC/EMH	Environmental Management Directorate, Cultural Resource Division
AAC/EM-PAV	Environmental Management Directorate, Public Affairs
AAC/EMSN	Environmental Management Directorate, Stewardship Division, Natural Resources Branch
AAC/EMSP	Environmental Management Directorate, Stewardship Division, Environmental Analysis Branch
AAC/JAV	Environmental Law Office
AAC/SEOG	Ground Safety Office
AAC/SEU	Range Safety Office
AACI	AAC Instruction
AF	Air Force
AFB	Air Force Base
AFI	Air Force Instruction
AFMC	Air Force Materiel Command
AFOSH	Air Force Occupational and Environmental Safety, Fire Protection and Health
AGL	Above Ground Level
AICUZ	Air Installation Compatible Use Zone
AR	Aerial Refueling Route
ARTCC	Air Route Traffic Control Center
ASEL	A-weighted Sound Exposure Level
BMP	Best Management Practice
CATEX	Categorical Exclusion
CCCL	Coastal Construction Control Line
CEQ	Council on Environmental Quality
CFA	Controlled Firing Areas
CFR	Code of Federal Regulations
CZMA	Coastal Zone Management Act
dB	Decibel
dBA	A Weighted Noise Level in Decibels
dBC	C-Weighted Noise Level in Decibels
dbh	Diameter at Breast Height
dBP	Peak Sound Pressure Level in Decibels
DDT	Dichlorodiphenyltrichloroethane
DoD	Department of Defense
DOE	Department of Energy
DOT	Department of Transportation
DU	Depleted Uranium
EA	Environmental Assessment
EFH	Essential Fish Habitat
EGTTR	Eglin Gulf Test and Training Range
EIAP	Environmental Impact Analysis Process
EO	Executive Order
EOD	Explosive Ordnance Disposal
EPF	Environmental Planning Function
ESA	Endangered Species Act
EWTA	Eglin Water Test Areas
F	Fahrenheit
FAA	Federal Aviation Administration

LIST OF ACRONYMS, ABBREVIATIONS, AND SYMBOLS CONT'D

FAS	Federation of American Scientists
FDEP	Florida Department of Environmental Protection
FEMA	Federal Emergency Management Agency
FFA	Freefall Air
FL	Flight Level
FNAI	Florida Natural Areas Inventory
ft	Foot
ft^2	Square Feet
FWC	Florida Fish and Wildlife Conservation Commission (formerly FGFWFC)
GIS	Geographic Information System
IAC	International Action Center
ICAO	International Civil Aviation Organization
IFR	Instrumentation Flight Rules
IHE	Insensitive High Explosives
in	Inch
INRMP	Integrated Natural Resources Management Plan
JTA	Joint Test Assembly
km	Kilometer
km^2	Square Kilometer(s)
L_{dn}	Day-Night Average Sound Level
LF/MF	Low Frequency/Medium Frequency
lmax	Maximum Noise Level
MAJCOM	Major Command
MC	Military Characteristics
MEA	Management Emphasis Area
mg/m^3	Milligram per Cubic Meter
mi^2	Square miles
MMPA	Marine Mammal Protection Act
MOA	Military Operations Area
mph	Miles per Hour
MSDS	Material Safety Data Sheets
MSL	Mean Sea Level
MTR	Military Training Route
NAAQS	National Ambient Air Quality Standards
NAS	National Airspace System
NASA	National Aeronautics and Space Administration
NEPA	National Environmental Policy Act
NIOSH	National Institution for Occupational Safety and Health
NJDHSS	New Jersey Department of Health and Senior Services
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOTAM	Notice to Airmen
NOTMAR	Notice to Mariners
NPDES	National Pollutant Discharge Elimination System
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
ppt	Parts per Thousand
psf	Pounds per Square Foot
psi	Pounds per Square Inch
RAIS	Risk Assessment Information System
RCRA	Resource Conservation and Recovery Act
RCW	Red-cockaded Woodpecker
REG	Retarded Ground
ROI	Region of Influence
rpm	Revolutions per Minute

LIST OF ACRONYMS, ABBREVIATIONS, AND SYMBOLS CONT'D

SEL	Sound Exposure Level
SIP	State Implementation Plan
SOP	Standard Operating Procedures
SPL	Sound Pressure Level
SRD	Secret Restrictive Data
STS	Stockpile-to-Target Sequence
SUA	Special Use Airspace
T0	Time Zero
TA	Test Area
TTR	Tonopah Test Range
U.S.	United States
USA	United States of America
USACE	U.S. Army Corps of Engineers
USC	United States Code
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USN	U.S. Navy
VOR	Very-high Frequency Omnidirectional Range
WR	War Reserve
WSEP	Weapons Systems Evaluation Program

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1. PURPOSE AND NEED FOR ACTION

1.1 PROPOSED ACTION

Air Combat Command has requested the use of Eglin Air Force Base (AFB) (Figure 1-1) as an alternative to the Department of Energy's (DOE) Tonopah Test Range (TTR) for conducting B61 Joint Test Assembly (JTA) Weapons Systems Evaluation Program (WSEP) flight tests. These flights are part of the DOE and Department of Defense (DoD) surveillance testing of the enduring stockpile and not a test of new weapons or weapon components. The purpose of the B61 flight test program is to test the B61 JTA in normal "stockpile-to-target sequence" (STS). Environmental conditions at Eglin will allow for testing at higher humidity levels and lower target altitudes. The goal for the test is high-speed, low- and high-altitude release on Test Area (TA) B-70. The desired target will be a 90,000-ft^2 (300x300) concrete pad constructed on TA B-70. Additional testing would include a shallow-water drop in the Gulf of Mexico (W-151 in $\leq$50 foot depth). WSEP flight tests would include B-52, B-2, F-15E, or F-16C aircraft dropping B61 JTAs, with each test employing a "drop/watch/retrieve" sequence. The JTAs would be immediately removed after each test. A B61 test event would occur approximately every two years beginning in 2004. A test event would include the release of one to two JTAs at the selected test area.

B61 JTA fusing options include the following two scenarios.

Freefall Air (FFA)

1. Release from aircraft at time zero (T0)
2. Spin rocket fires at T0 + 0.3 to 1.6 seconds
3. Parachute deploys at preset altitude (end event)

Retarded Ground (REG)

1. Release from aircraft at T0
2. Parachute deploys at T0 + 0.3 to 1.6 seconds
3. Ground impact
4. End event at preset time from release (no visual cue)

The military has nuclear weapons in their active inventory or stockpile. These weapons are full up weapons ready for use and are called war reserve (WR) nuclear weapons. Every year a certain number of these WR nuclear weapons are randomly selected to be shipped to a DOE production facility where selected parts from those WR weapons are used to build a JTA. The JTAs are then flight tested to assess the performance of the WR parts (Figure 1-2). Each JTA retains as many of the WR components as possible including portions of the explosive package, but no JTA configuration is capable of providing a nuclear detonation. The B61 has five versions divided into two families. The Mod 3, Mod 4, and Mod 10 are one family, which is delivered by tactical aircraft; the Mod 7 and Mod 11 are the other family, which is delivered by strategic bomber aircraft. Mod 11 would not be tested at Eglin. Each Mod (3/4/7/10) has different JTA configurations used to test the different B61 fusing and aircraft delivery options. JTA configurations JTA1, JTA3, JTA6, and JTA9 are applicable to testing on Eglin ranges.

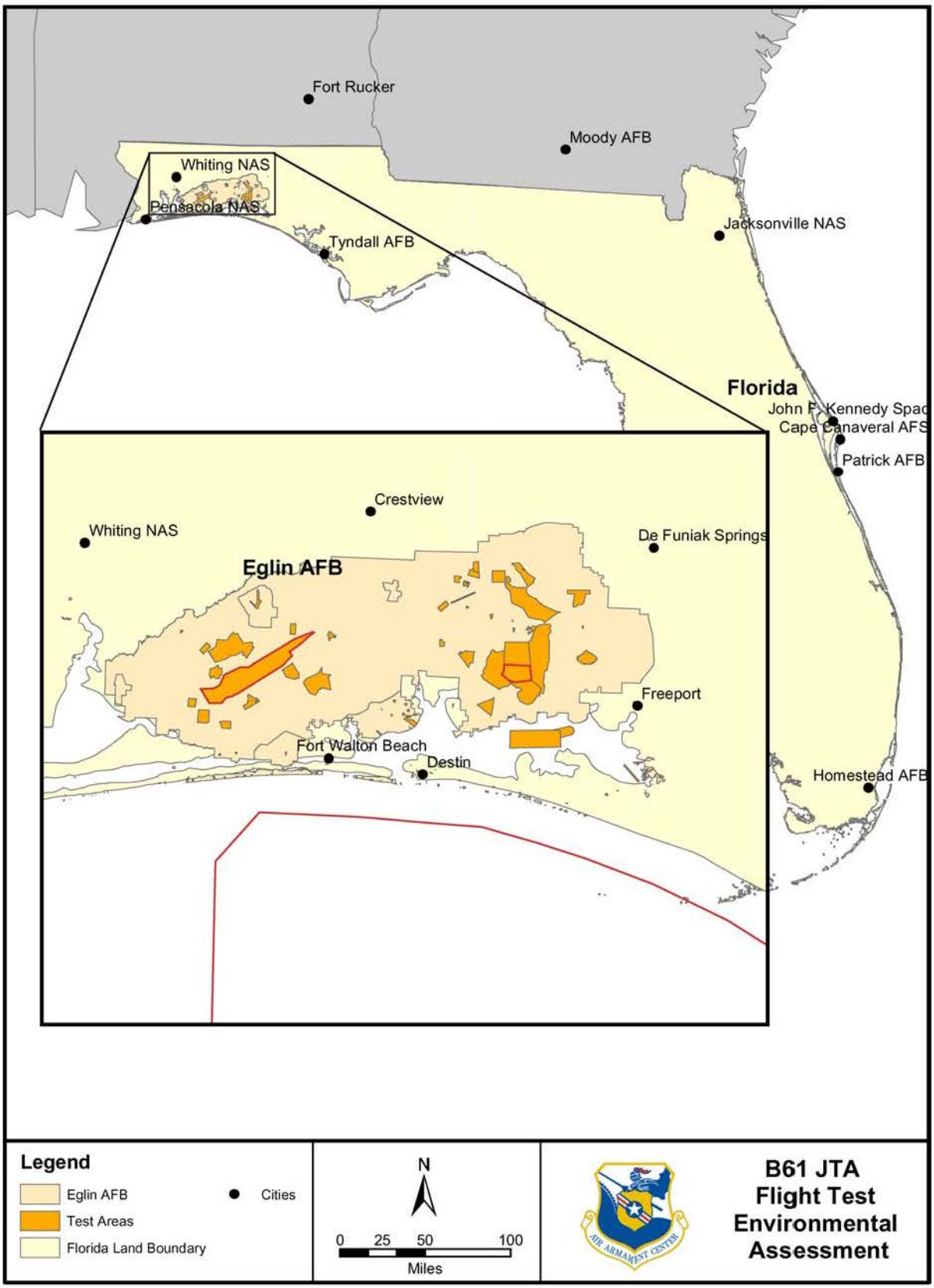

Figure 1-1. JTA Test Area Locations: B-70, C-52C, and the Eglin Gulf Test and Training Range (EGTTR)

Figure 1-2. B61 JTA WSEP

In the 1970s and 1980s, B61-0/2 JTAs were tested at TA B-70 and C-52 off of Navy aircraft.

The JTA1, JTA3, and JTA6 configurations contain war reserve (WR) neutron generators and depleted uranium as a mockup for WR parts. The depleted uranium would not be expended. All JTA configurations also use sealed thermal batteries that contain lithium compounds and chromate/calcium compounds as well as explosive hazards. Most explosives in the JTAs are located inside the sealed center case section, which is a 0.52-inch-thick hard aluminum extrusion for the Mods 3/4/7/10, and are not accessible during or after a normal test, presenting no hazard. The explosives outside the center case section are accessible; however, none of the JTA configurations planned for testing at Eglin AFB would contain Insensitive High Explosives (IHE).

The B61 JTA Mod 3/4/7/10 specifications are as follows.

- Length: ~142 inches
- Diameter: 13 inches
- Launch Weight: 760 pounds
- Spin Rate: Retarded Ground–none; Retarded Air–none, Freefall Air–720 rpm max

Aircraft Delivery

Aircraft may include F-15E, F-16C, B-52H, and B-2A (Figure 1-3). These aircraft drop JTAs during flight following a predetermined altitude as directed by Flight Safety. Other assets on site may include chase boats used in the retrieval of the JTA from the Gulf target drop areas.

Figure 1-3. F-15E and F-16C Delivery of JTA

1.2 NEED FOR PROPOSED ACTION

The DOE requires an alternative to the DOE Tonopah Test Range to conduct B61 JTA WSEP flight tests to assess the systems at higher humidity levels and lower target altitudes. In addition, the Eglin range would provide assessment performance of the JTAs during shallow-water drops in salt water.

1.3 OBJECTIVE OF THE PROPOSED ACTION

The B61 flight test program is one of the evaluation activities performed on the B61 stockpiled weapons that support weapons reliability, safety, and use control feature assessments. The primary purpose of all the evaluation activities is the timely detection and correction of problems in the stockpile hardware. The evaluation programs are designed to ensure that materials conform to design and reliability requirements throughout its stockpile life as set forth by the Military Characteristics (MCs). The flight test program specifically is used to verify weapon system function (less the main assembly) in normal STS environments and to demonstrate continuing compatibility between subsystems using flight-testing and the most realistic environmental conditions. The overall objectives of the Joint DOE/DoD system level tests are to:

- Verify function of weapon system in normal STS environment.
- Demonstrate continuing DoD/DOE compatibility.
- Provide weapon reliability data.
- Validate laboratory testing.
- Contribute to training and evaluation of DoD operational service personnel.

1.4 RELATED ENVIRONMENTAL DOCUMENTS

- *Test Area B-70 Final Programmatic Environmental Assessment, Eglin Air Force Base, FL,* March 1998 (U.S. Air Force, 1998)
- *Environmental Assessment for Sandia Standoff Detection System, Eglin Air Force Base, Florida,* June 2003 (U.S. Air Force, 2003)
- *Eglin Gulf Test and Training Range, Eglin Air Force Base, Florida. Final Programmatic Environmental Assessment,* August 2003 (U.S. Air Force, 2003a)
- *Test Area C-52 Complex Final Programmatic Environmental Assessment. Eglin Air Force Base, Florida,* June 1999 (U.S. Air Force, 1999)
- *Overland Air Operations Final Programmatic Environmental Assessment. 46th Test Wing, Range Environmental Planning Office, Air Force Developmental Test Center, Eglin AFB, Florida* (U.S. Air Force, 1998a)

1.5 SCOPE OF THE ENVIRONMENTAL ASSESSMENT

This document was prepared in accordance with the requirements of the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality (CEQ) regulations of 1978, and 32 CFR (Code of Federal Regulations) Part 989. To initiate the environmental analysis, the proponent (46 OG/OGP) submitted an Air Force (AF) Form 813 – Request for Environmental Impact Analysis – to the Air Armament Center/Environmental Management Directorate, Stewardship Division, Environmental Analysis Branch (AAC/EMSP). A review of the AF Form 813 by EMSP determined that the Environmental Impact Analysis Process (EIAP) Working Group should address the Proposed Action.

1.5.1 Issues Eliminated from Detailed Analysis

Based on the scope of the Proposed Action and Alternatives and preliminary analyses, the following issues were eliminated from further analyses.

Air Quality

Air quality, with respect to those pollutants for which the U.S. Environmental Protection Agency (USEPA) has promulgated national ambient air quality standards (NAAQS) and/or the Florida Department of Environmental Protection (FDEP) has promulgated an ambient standard, was eliminated as a potential issue. A preliminary analysis of project-generated air emissions was conducted to determine if:

- There would be a violation of NAAQS.
- Emissions would contribute to an existing or projected air quality violation.
- Sensitive receptors would be exposed to substantial pollutant concentrations.
- There would be an increase of 10 percent or more in Okaloosa County criteria pollutants emissions.

- Any significance criteria established by the Florida State Implementation Plan (SIP) would be exceeded.
- A permit to operate would be required.
- A change to Eglin's Title V permit would be required.

Under existing conditions, the ambient air quality in Okaloosa and surrounding counties is classified as attainment for all NAAQS as promulgated by USEPA. The only air emissions of consequence associated with the Proposed Action or Alternatives are related to the construction of the 90,000-ft^2 concrete target pad. Emissions would result from fugitive dust emissions and equipment fuel combustion emissions during construction.

For impact analysis, the estimated air emissions were compared to the Okaloosa County 2002 emission inventory. Potential impacts to air quality are then identified as the total emissions of any pollutant that equals 10 percent or more of the Okaloosa County pollutant emissions for that specific pollutant. The 10 percent criteria approach is used in the General Conformity Rule as an indicator for impact analysis for non-attainment and maintenance areas. However, for impacts screening in this analysis, a more restrictive criteria than required in the General Conformity Rule was used. Rather than comparing emissions from test activities to regional inventories (as required in the General Conformity Rule), emissions were compared to the Okaloosa County inventory (a smaller area).

Preliminary screening found that the associated emissions from the Proposed Action (estimated using USEPA emission factors) would be less than one-tenth of 1-percent of Okaloosa County's 2002 air emissions in each criteria pollutant category. As a result, there would be no adverse impacts to air quality and no further analysis was conducted.

Cultural Resources

Within the boundaries of TA B-70, C-52C, and target drop area within Eglin Gulf Test and Training Range (EGTTR) W-151, there are no cultural resource concerns. If activities take place outside of the boundaries of B-70, C-52C, or the target area in W-151, the Eglin Cultural Resources Division office should be contacted. No adverse effects on cultural resources are anticipated.

1.5.2 Issues Studied in Detail

Preliminary analysis based on the scope of the Proposed Action and Alternatives identified the following potential environmental issues warranting detailed analysis.

Noise

Noise from aircraft, which includes supersonic flight, is a potential source of injury to humans and biological resources. Analysis of this issue evaluates the noise profiles associated with the alternatives and the potential for the 140-dBP (peak sound pressure level in decibels) noise profile (potential injury level) to reach public users adjacent to the Eglin Reservation and in the Gulf.

Physical Resources

Physical resources are described as the physical environment as it relates to the atmosphere (climate and meteorology), geomorphology (landforms, terrain, topography, and soils), geology (underlying land formations), and hydrology (surface and ground waters). Analysis of this issue focuses on identifying those physical resources that would be impacted by the alternatives and the resulting consequences to the quality and utility of those resources.

Mission support activities, such as set-up activities to construct the concrete pad, could impact soil quality. Additionally, the JTA may introduce pollutants in the form of debris and/or chemical materials to the soil or water. Analysis focuses on assessing the locations of such activities under the alternative actions and the potential to impact these areas. This is accomplished using geographic information systems (GISs) and current hydrologic literature and data for the surrounding areas.

Biological Resources

Biological resources (plants and animals) and related habitats (foraging and nesting areas) may be directly affected by the alternative actions. Impacts analysis focuses on the potential for actions to directly, physically affect sensitive biological organisms (threatened and endangered species) and the potential for actions to alter/affect the quality and utility of the sensitive habitats (i.e., essential habitat and foraging areas) frequented by those species. B61 JTA WSEP flight tests and support activities could affect biological resources (marine mammals, fish, marine birds, etc.) in the EGTTR via the introduction and potential entanglement of biological resources with the JTA parachute. The testing may also take place during sea turtle nesting season. The location and duration of mission activities in relation to sensitive and threatened and endangered species and habitat in the Gulf of Mexico are analyzed using current GIS coverage, and existing literature to determine the potential for adverse impacts associated with the alternative actions.

Anthropogenic Issues/Resources

Anthropogenic issues/resources studied in detail include safety, bioenvironmental hazards, and chemical materials/waste, as well as socioeconomic factors such as population, community property, and demographics. Impacts analysis focuses on the potential for the alternative actions to affect the quality of life in surrounding communities, as well as the quality and utility of significant historical and cultural resources. Safety/Bioenvironmental Hazards of the B61 JTA WSEP flight tests include potential safety hazards due to the encased neutron generator and depleted uranium (DU) ballast. Analysis focuses on determining safety footprints and restricted zones associated with weapon testing and reviewing associated standard operating procedures (SOPs) used to ensure that military personnel and the public would not be exposed to bioenvironmental hazards. Notification of Bioenvironmental Engineering Radiation Section (SGPBR) prior to testing is required.

Restricted Access and Socioeconomics

Restricted access is defined as an increase or addition in restricted areas and/or an increase or addition to the frequency of access restriction to public areas. Safety footprints associated with the alternative actions may result in restricted access to the public in areas normally open for

outdoor use in the EGTTR, as well as inhibit use of other test areas, air space, and facilities by the military if safety footprints associated with testing extend beyond the test sites/areas. Analysis of this issue focuses on assessing restricted access footprints and the duration of closures and subsequent potential impacts to recreational and commercial usage in restricted areas.

Environmental Justice

Concern that minority populations and/or low-income populations bear a disproportionate amount of adverse health and environmental effects led to the issuance of Executive Order 12898 in 1994. Executive Order (EO) 12898, Environmental Justice, and the accompanying Memorandum ensure that federal agencies focus attention on *"the environmental effects, including human health, economic, and social effects, of federal actions, including effects on minority communities and low income communities, when such analysis is required by NEPA 42 USC section 4321 et seq."*

Environmental justice addresses the potential for a proposed federal action to cause disproportionately high and adverse health effects on minority populations or low-income populations. Executive Order 13045 mandates that all federal agencies assign a high priority to addressing health and safety risks to children, coordinating research priorities on children's health, and ensuring that their standards take into account special risks to children. The proposed activities would take place within the Eglin Reservation and EGTTR; however, noise from supersonic drops may migrate into surrounding residential areas. Therefore environmental justice impacts will be addressed and presented under the noise analysis section.

1.6 APPLICABLE REGULATORY REQUIREMENTS AND COORDINATION

Agency Consultation

A Coastal Zone Management Act (CZMA) Consistency Determination must be made pursuant to Section 307 and 15 CFR Part 930 and in compliance with the Florida Coastal Management Program.

Permits and Agency Reviews

The Florida State Clearinghouse will review the proposed and alternative actions for consistency with state agencies and regulations. A "Joint Works in the Water" permit will not be required as actions in B-70 and W-151 would not disturb any wetlands. Additionally, the shallow-water drop of the B61 JTA in test area W-151 would not permanently alter or damage the seafloor bottom, and therefore a permit for this action will not be necessary either.

Construction of the concrete pad target will require a National Pollutant Discharge Elimination System (NPDES) Permit from the Florida Department of Environmental Protection (FDEP). Phase II of this permit regulates small construction activities (disturbing between one and five acres of land) that will increase impervious surface areas and stormwater runoff.

1.7 DOCUMENT ORGANIZATION

This Environmental Assessment follows the organization established by the Council on Environmental Quality (CEQ) regulations (40 CFR, Parts 1500-1508). This document consists of the following chapters.

1. Purpose and Need for Action
2. Description of Proposed Action and Alternatives
3. Affected Environment
4. Environmental Consequences
5. Plan, Permit, and Management Requirements
6. List of Preparers
7. List of Contacts
8. References and Applicable Documents

Appendix A Sensitive Species

Appendix B Coastal Zone Management Act

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2. DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

As required by federal regulation, this Environmental Assessment addresses the possible environmental impacts of the Proposed Action, including two Alternatives and a No-Action Alternative. Section 2-5 provides a summary of the issues and potential impacts associated with Alternative 1, Alternative 2, and a No-Action Alternative.

2.1 ALTERNATIVE 1 (PREFERRED ALTERNATIVE)

Testing of the B61 JTA WSEP, Alternative 1, involves a test event that would occur approximately every two years beginning in 2004 on both TA B-70 and in W-151. Alternative 1 involves a maximum of four bomb drops during each test year (Table 2-1). Testing would involve high-speed, high and low altitude drops of the JTAs.

Table 2-1. JTA WSEP Flight Test Proposed Action

Profile	B-70	EGTTR W-151 Shallow-Water Drop
Freefall Air (FFA) – parachute	1	1
Retarded Ground (REG) – parachute	1	1

Aircraft may include F-15E, F-16C, B-52H, and B-2A. These aircraft drop JTAs during flight following a predetermined altitude as directed by Flight Safety. The B61 JTA would be launched from the aircraft at altitudes of 500 to 6,000 feet.

Under Alternative 1, there are two potential targets to be used for the B61 JTA WSEP flight tests: on land at TA B-70 (Figure 2-1) and in the EGTTR, W-151 (Figure 2-2). The target at B-70 consists of a 90,000-ft^2 (300x300) concrete pad that would be constructed for testing. The goal of testing on B-70 is a high-speed, high and low altitude release. Some releases at B-70 would be supersonic. Shallow-water targets would be located in the EGTTR, W-151 (at <50 feet of water depth) and would not be supersonic.

The JTAs will be immediately retrieved following testing at both target areas.

2.2 ALTERNATIVE 2: JTA WSEP FLIGHT TESTS AT B-70, W-151, AND C-52C

Alternative 2 includes the activities outlined in Alternative 1 with the inclusion of a 20,000-foot above ground level (AGL), high altitude drop of the B61 JTA at TA C-52C. This drop would be a freefall air scenario and *would not* be supersonic. The proposed target areas for C-52C are located in Figure 2-3.

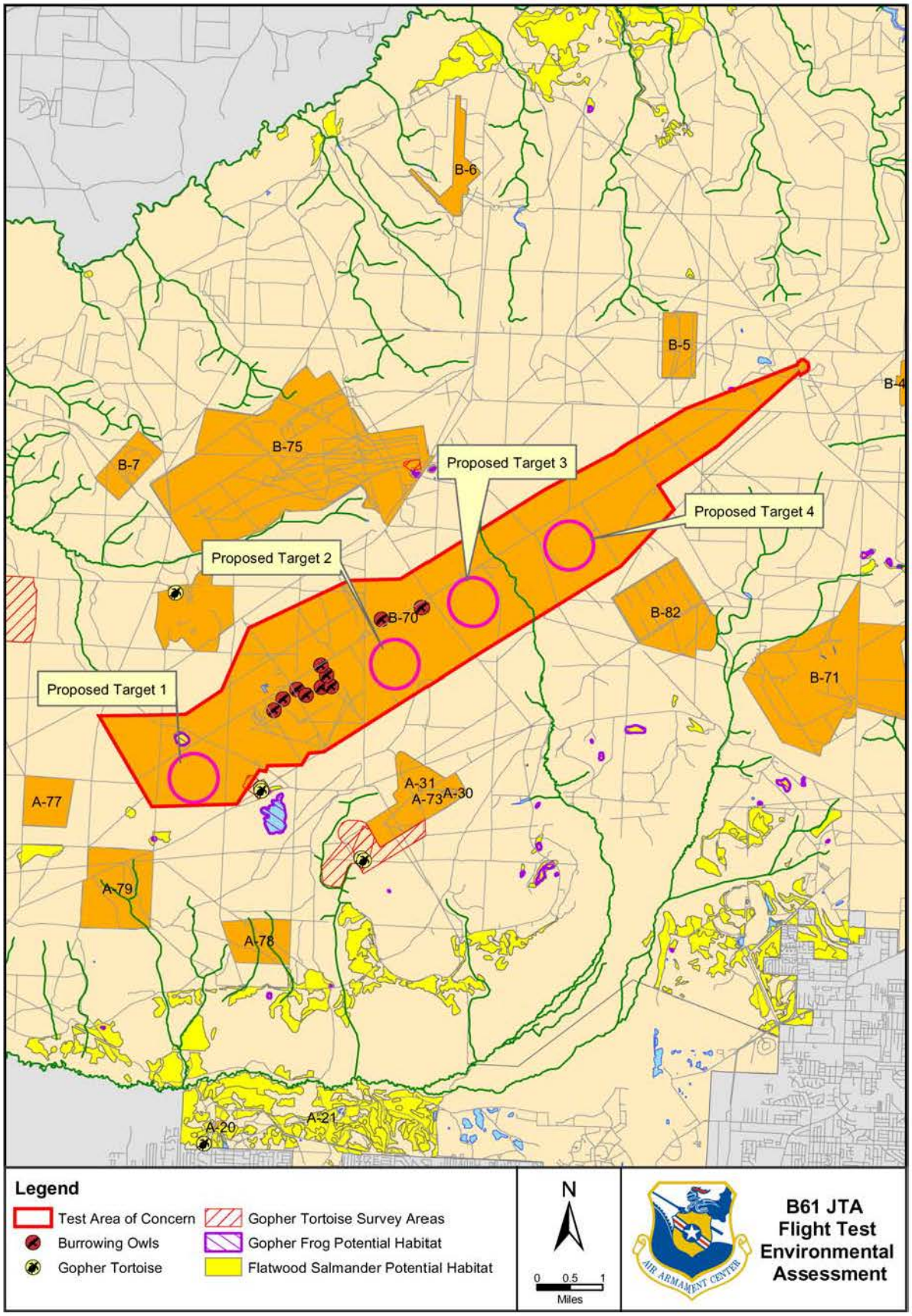

Figure 2-1. Location of TA B-70 Target Areas Proposed Action

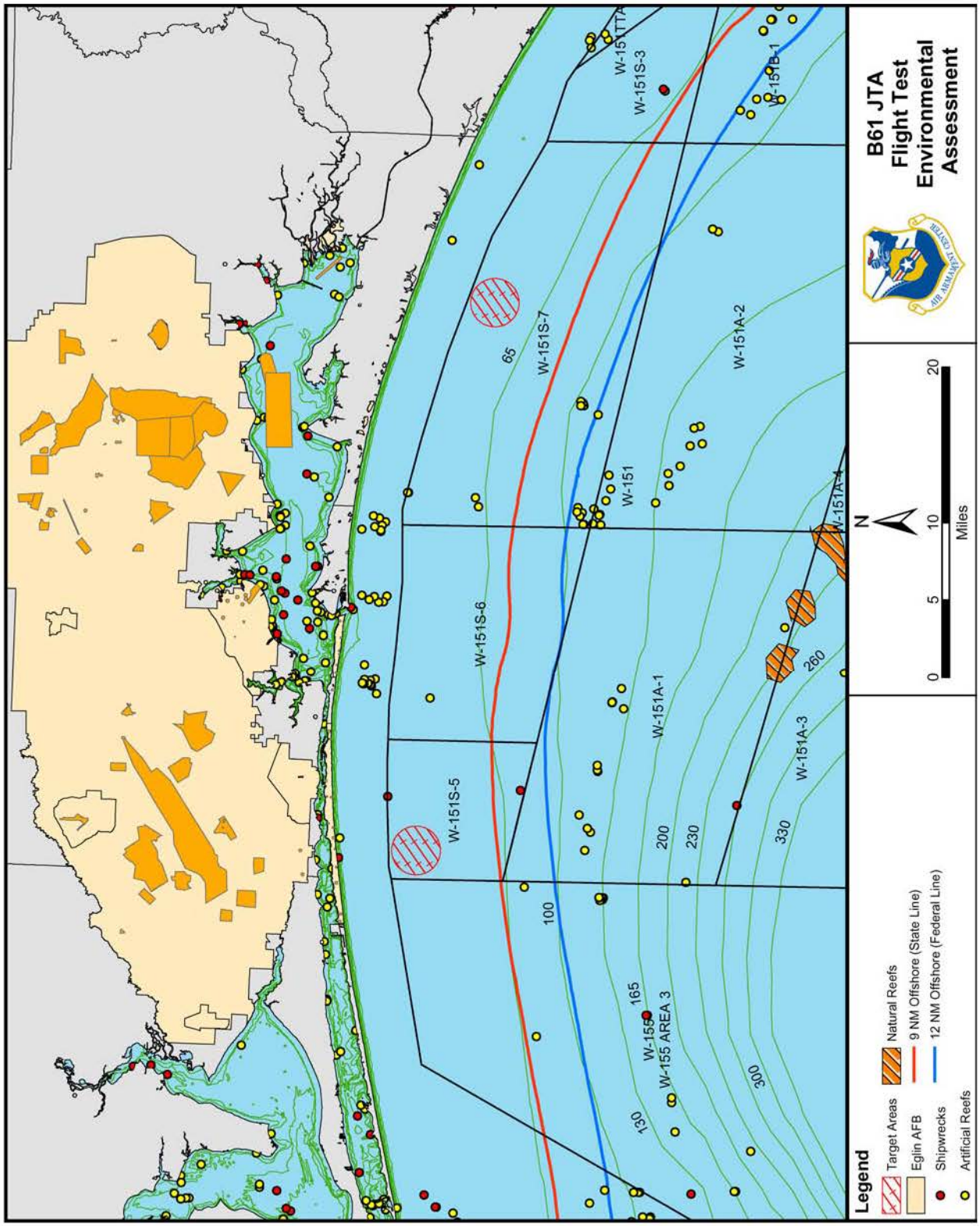

Figure 2-2. Proposed Target Areas in the EGTTR W-151

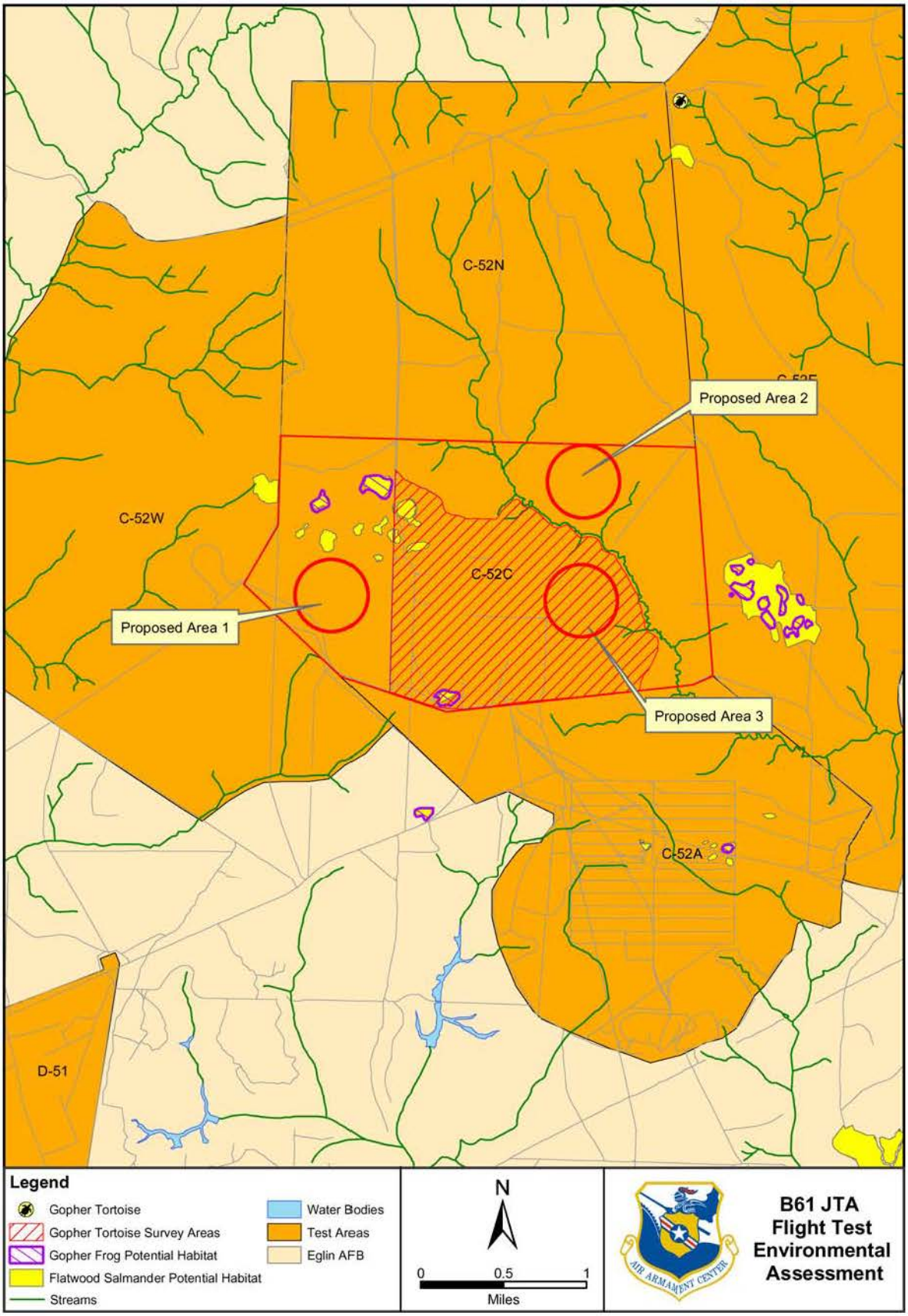

Figure 2-3. Proposed Target Area at C-52C

2.3 NO-ACTION ALTERNATIVE

The No-Action Alternative would be to not test the B61 JTA WSEP at Eglin AFB.

2.4 ALTERNATIVES CONSIDERED BUT NOT CARRIED FORWARD

Other test areas on Eglin AFB were considered for the B61 JTA drop; however, the ranges would not support supersonic testing. Weapon recovery concerns in the EGTTR require water depths to be $\leq$50 feet, which limited the use of several areas within the EGTTR.

2.5 COMPARISON OF ALTERNATIVES

Table 2-2 provides a summary of the issues and potential impacts associated with all three alternatives.

Table 2-2. Summary Matrix of Issues, Proposed Action and Alternatives, and Potential Impacts

Issue	Alternative 1 – Preferred Alternative	Alternative 2	No Action
Noise	Areas southwest of TA B-70 normally accessible to the public would need to be cleared of non-mission personnel to prevent adverse effects to the public or mission personnel on the reservation. Overpressures capable of breaking windows can be produced by supersonic overflights, but are primarily a concern for any buildings on the reservation beneath the flight track. The action could potentially produce noise off the reservation is considered to carry a high risk of noise complaints.	TA C-52 would not employ supersonic flight and would encompass mission-generated noise from the aircraft. Thus, noise impacts are not anticipated at this site. However, the impacts from noise at TA B-70 would be the same as those presented for Alternative 1.	No Impact
Biological Resources	Effects from supersonic noise to sensitive species are not anticipated to be harmful because of the infrequency of the test and the brief exposure time. No impacts to biological resources from the JTA testing are anticipated.	TA C-52 would not employ supersonic flight and would encompass mission-generated noise from aircraft, thus noise impacts to biological resources are not anticipated at this site. However, the impacts from noise at TA B-70 would be the same as those presented for Alternative 1.	No Impact

Table 2-2. Summary Matrix of Issues, Proposed Action and Alternatives, and Potential Impacts Cont'd

Issue	Alternative 1 – Preferred Alternative	Alternative 2	No Action
Soils	To minimize soil runoff at the construction site, best management practices (BMPs) typically used for construction projects on Eglin, would be employed to eliminate impacts. A NPDES permit is required, as approximately 2 acres of soil would be disturbed to construct the 90,000-ft^2 pad. New concrete pad construction requires stormwater regulations for new impervious surfaces, Chapter 62-25, Florida Administrative Code (F.A.C.) to be satisfied. The project may be exempt from the regulations under 62-25 F.A.C. if design is such that the swale exemption criteria is met under 62-25.030 (1)(c) F.A.C.	A concrete pad will not be constructed at C-52C. Impacts would be the same as Alternative 1	No Impact
Water Quality	Streams on B-70 are outside of the target area footprints, thus, there should be no impacts to water quality. The B61 JTA spin rocket and motor would produce explosive by-products that may enter Gulf waters; these amounts are minimal and would not produce adverse environmental impacts. The B61 JTA would be immediately retrieved upon entry into the Gulf, and the DU and neutron generator should remain intact. No impacts from the neutron generator or DU would ensue.	No streams are located within the B61 JTA footprint on TA C-52C. No impacts are anticipated.	No Impact
Restricted Access	Commercial fishing vessels and all other watercraft would be restricted from the target areas in W-151 during the mission. Access to recreational and commercial fishing/diving may be restricted. Shipping routes for waterborne craft may be temporarily closed. A Notice to Mariners would be issued prior to the closure.	Same as Alternative 1	No Impact
Safety/ Socioeconomics	No significant loss or contribution to income is anticipated from twice yearly supersonic overflights from the Proposed Action	Same as Alternative 1	No Impact
Bioenvironmental Hazards	The depleted uranium (DU) would not be expended, and should not affect the environment at TA B-70 and W-151 during normal testing. Firing of the spin rocket and gas generator may contaminate post-test B61 JTAs with explosive by-products. Any personnel handling the post-test B61 JTA must wear protective gear until the contaminated areas are either cleaned up or covered by tape/and or plastic to prevent contact with contaminants. Chemical compounds within the thermal batteries may be released should the battery case split open during an abnormal test. Most explosives and hazardous materials are located inside the sealed center case section and are not accessible during or after a normal test, presenting no hazard.	Same as Alternative 1	No Impact
Air Space	Overflights and aircraft in the Gulf of Mexico may be restricted during the B61 JTA tests. Coordination with the appropriate Eglin divisions would be required to identify proximal training areas and determine the potential impacts on and conflicts with other usage of air space.	Same as Alternative 1	No Impact

3. AFFECTED ENVIRONMENT

Test Area B-70

Test Area B-70 consists of a 13x1.25-mile predominantly cleared area (10,792 acres) located 15 miles northwest of Eglin Main (Figure 1-1). Uncleared areas include approximately 1,100 acres of partially cleared regions and 400 acres of densely vegetated regions located along the TA B-70 perimeter. The cleared areas consist of target areas, roadways, towers, and buildings established over the grassy plains, and vegetation species of broomsedge, switch grass, grasses and herbs, and some low-growing shrubs. Ground cover over the cleared areas of TA B-70 is routinely maintained (approximately every two years) by several methods, including bush hogging, roller chopping, prescribed burns, and/or mowing.

Test Area C-52C

This is an air-to-surface bomb and rocket test area. TA C-52C (formerly known as Auxiliary Field 8) is a large cleared area about 2.25 miles by 1.5 miles contiguous with TAs C-52A, C-52E, C-52N, and C-52W. It is used for air-to-ground munitions testing, countermeasures development and testing, and ground functional fuse testing. Weapons are tested on either of two prepared flame fuel areas, a submunition grid, or either of the two airfield runways (formerly Field 8). Field 8 runways are classified as targets and cannot be used for landing aircraft.

Gulf of Mexico

The Gulf of Mexico, known to locals as simply the "Gulf," is a restricted oceanic basin, nearly surrounded by the United States, Mexico, and Cuba. In the southeastern portion of the Gulf, the Yucatan Straits and the Florida Straits connect the Gulf with the Caribbean and western Atlantic Ocean, respectively (Dames and Moore, 1979). The Gulf is characterized by a shallow and, in places, broad continental shelf, steep slopes leading from the shelf, two large deep-water plains, and scattered regions where the bottom is somewhat higher (Weber et al., 1992). The average depth is over three-quarters of a mile and the maximum depths in the deep waters are over two miles. The continental shelf is widest along the eastern margin, called the West Florida Shelf; along the northwestern margin, called the Texas-Louisiana Shelf; and along the southern margin, called the Campeche Shelf (Dames and Moore, 1979).

3.1 PHYSICAL RESOURCES

3.1.1 Noise

Existing Noise Environment

Noise impacts for TA B-70 will be analyzed due to the supersonic B61 JTA drop at the range. TA B-70 is an active weapons test area supporting a diversity of military activities. The region of influence (ROI) for noise includes TA B-70 and the abutting lands extending outward into surrounding communities. The existing acoustic environment in this area consists of natural and man-made sounds, some of which may be relatively constant and sustained and others that are brief but intense. These include explosive detonations, sonic booms, and natural events such as thunder. This type of noise is termed impulse noise. As described in the Test Area B-70

Programmatic Environmental Assessment (U.S. Air Force, 1998), the present impulse noise environment of TA B-70 is characterized by occasional supersonic overflights, occasional (two per year) bomb and missile detonations greater than 1,000 pounds net explosive weight, and shallow-water pond detonations. Noise recorders placed in the communities of Navarre (Holley area) and Ft. Walton Beach (Wright area), have recorded maximum sound pressure levels from sonic booms from supersonic missions in TA B-70 that have ranged from 105 to 136 dBP. Red-cockaded woodpeckers, a federally endangered species and burrowing owls, a state species of special concern near Centerline Road on TA B-70, are exposed on occasion to sound pressure levels of just less than 154 dBP from sonic booms. Overall, impulse noise from Eglin AFB missions approaching the 140-dBP level (upper 130s) rarely extends beyond the Eglin reservation boundary. Additional information on noise is presented in Chapter 4.

3.1.2 Soils

Lakeland Association

The Lakeland Association, the most common soil unit on Eglin AFB, comprises 78 percent of the soils on the reservation (U.S. Air Force, 2002). Like the base, the majority of soils within TA B-70 and well over 50 percent of soils on C-52C belong to this type (Figures 3-1 and 3-2). The Lakeland Association contains well-drained, brownish-yellow sands that have developed along the broadridge, tops, and slopes (U.S. Air Force, 2002). This type of soil is often found in areas with the highest elevations and with the greatest slopes on the reservation. The soil complex is formed on the underlying Citronelle Formation (U.S. Air Force, 2002).

Typically, the Lakeland Association has sandy surface layers with sandy subsoils that are more than 80 inches deep. A dark grayish-brown surface layer composed of loose sand reaches to about 6 inches deep. From 6 to 49 inches, loose, brownish-yellow sands are found. The soil type between 49 and 83 inches is again loose sand but is composed of a yellowish-brown hue. Finally, the deepest layer lies 73 to 80 inches below the surface and is composed of fine sand with a distinct reddish-yellow hue (U.S. Department of Agriculture, 1995).

The Lakeland soils are easily eroded because they lack cohesiveness and have limited water-holding capacity. The establishment and maintenance of vegetation is difficult because the soils are too sandy, low in productivity, or are on steep slopes (U.S. Air Force, 1995). Physical characteristics of soil associations on B-70 are summarized in Table 3-1.

Table 3-1. Physical and Chemical Data of the Main Soil of Test Areas B-70 and C-52C

Soil Type	Soil Depth (approx. inches)	Texture	Slope (%)	pH	Organic Matter (%)	Clay (%)	Permeability (inches/hour)
Lakeland	0-80	Sand	0-5	4.5 – 6.0	<1	5-10	6 – 20

Other Soil Types on B-70

In addition to the Lakeland Association, small pockets of well-drained to loamy sands of the Chipley-Foxworthy-Albany Association are also found within adjacent northeastern interstitial regions of TA B-70 (U.S. Air Force, 1995).

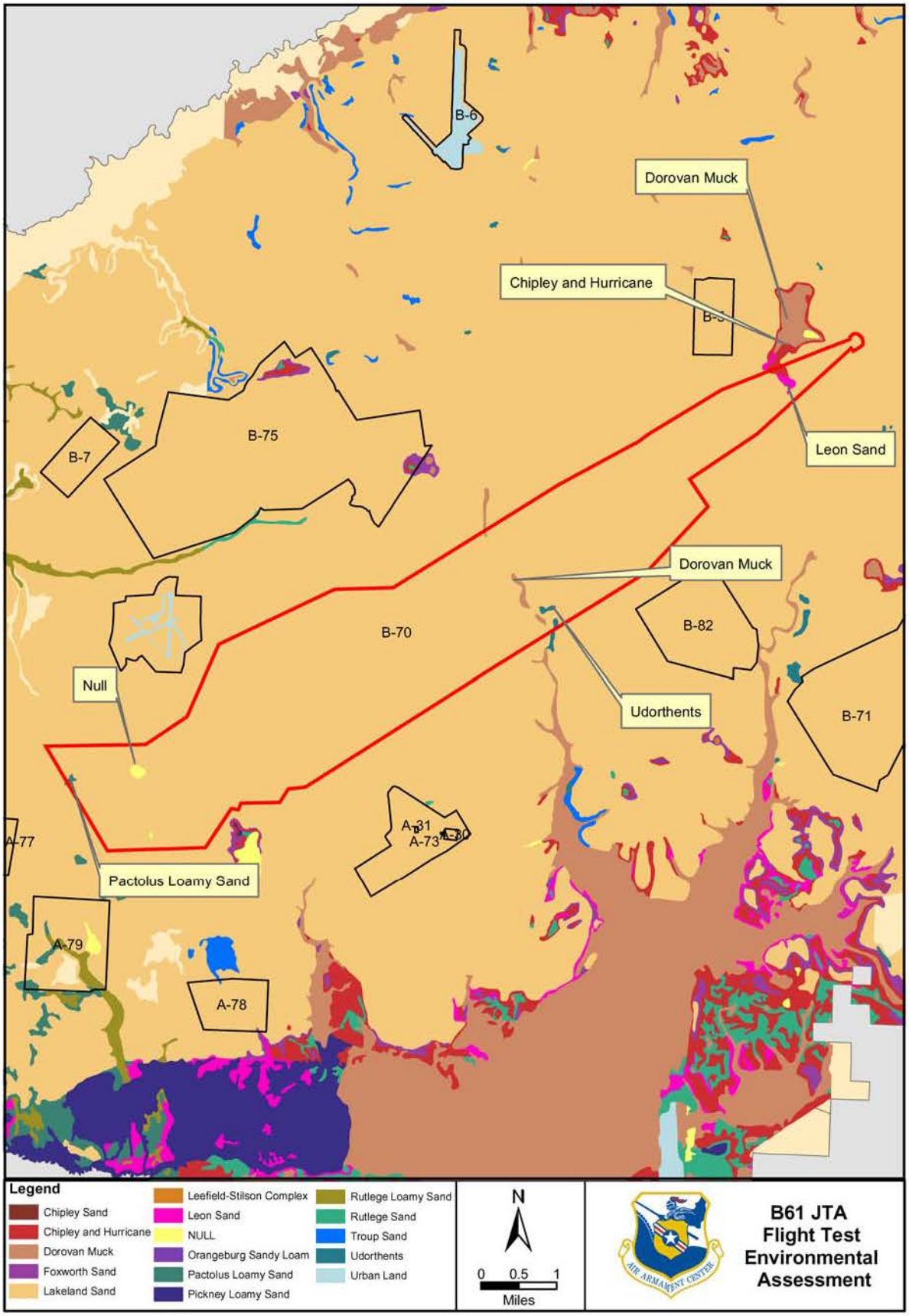

Figure 3-1. TA B-70 Soils

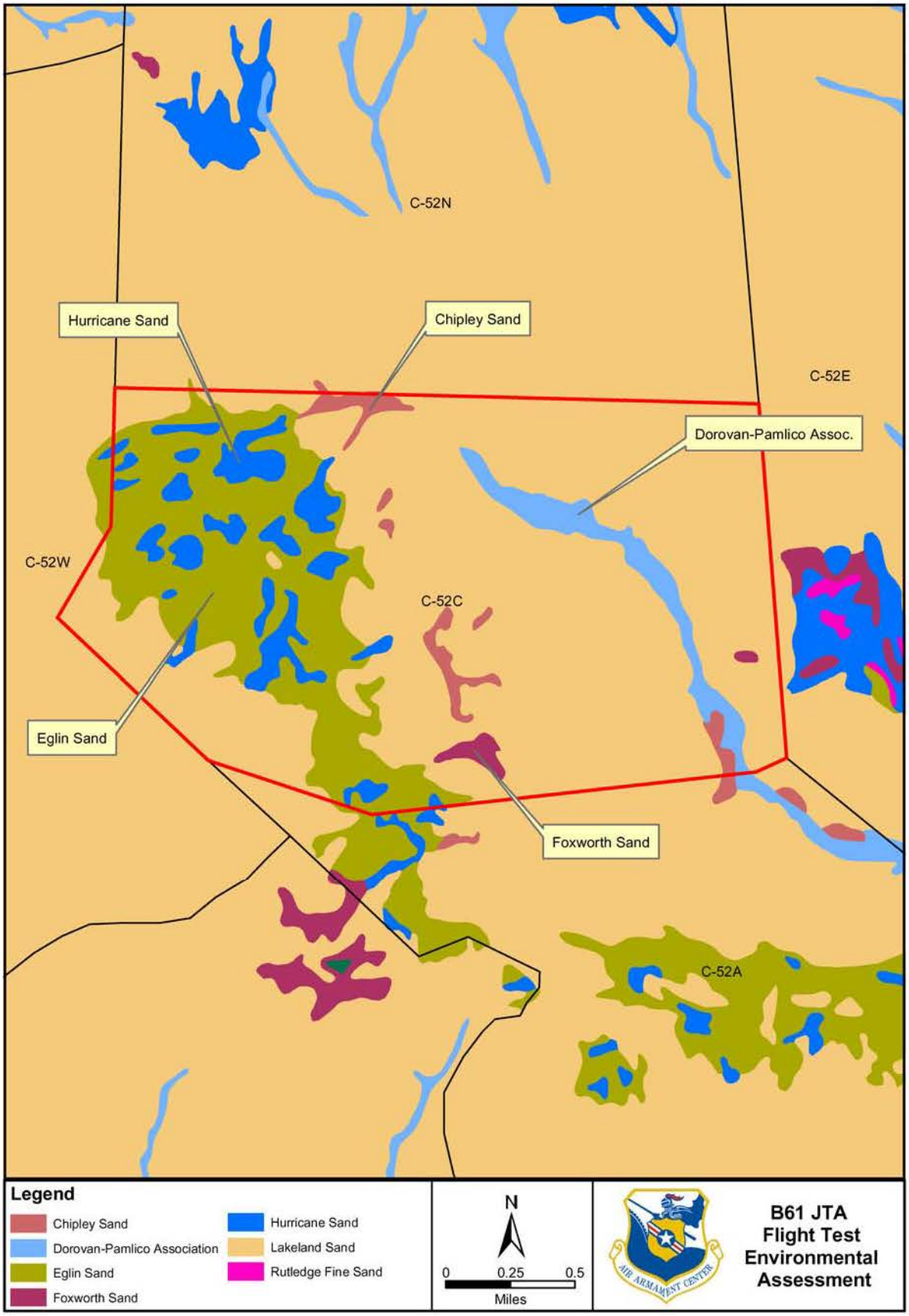

Figure 3-2. TA C-52C Soils

Small patches of Dorovan Muck, characterized by poorly drained soil formed by decomposed plant material, lies in the middle to southern portion of B-70 as well as adjacent to the northern boundary. Leon sand and the Chipley and Hurricane complex are located at the upper eastern boundary. These soils are deep, poorly drained sand typically found in level flatwoods areas. The Chipley unit is also found in the uplands association.

Eglin and Hurricane Sands

On C-52C, Eglin Sand comprises a large proportion of the test area soil types followed by Hurricane Sand (Figure 3-2). The Eglin series consists of very deep, somewhat excessively drained soils that formed in thick sandy marine sediments. Eglin soils are on nearly level to gently sloping broad upland landscapes on relatively low elevations within the sandhills. These soils are commonly found near the heads of drainageways. The water table fluctuates briefly between depths of 60 to 80 inches during periods of high rainfall. Runoff is low and permeability is rapid in the surface and subsurface layer and moderate to moderately rapid in the subsoil. The solum is greater than 80 inches thick. Soil reaction is very strongly acid or strongly acid in all layers. Texture is sand or fine sand throughout.

The Hurricane series consists of very deep soils that formed in sandy marine sediments. These soils are on nearly level to gently sloping, low, broad landscapes. Hurricane Sand contains sandy surface layers with sandy, organic matter subsoils that are typically 80 inches deep. At the surface down to 6 inches, this unit possesses dark grayish-brown loose sand, which is strongly acidic. Loose brownish-yellow sands lie beneath the surface layer, down to 33 inches. Between 33 and 42 inches deep, soils include brownish-yellow sand. The next layer possesses light gray sand with medium acidity. The deepest layer lies between 70 and 80 inches below the surface and is made up of acidic, firm, black sands coated in organic matter. Runoff is slow and permeability is rapid. A water table is at depths of 2 to 3.5 feet for three to six months during most years and at depths greater than 3.5 feet for the remainder of the time.

Other Sands on C-52C

Patches of Chipley sand like that at B-70 are located in the middle of C-52C and at the northern boundary. Foxworth sand, characterized by deep, moderately drained soils that formed in thick deposits of sandy marine or eolian sediments, is located at the southern boundary. The Dorovan-Pamlico Association comprises a small portion of the eastern side of the test area and is comprised of very deep, very poorly drained soils created from decomposed plant material.

Erosion

Soil erosion is a three-phase process of detachment, transport, and deposition of surface materials by water, wind, ice, or gravity initiated by drag, impact, or tractive forces acting on individual soil particles. It is a relentless process that is nearly impossible to stop, difficult to control, and easily accelerated by humans. Accelerated erosion caused by humans occurs at rates much greater than natural erosion conditions and has been shown to have detrimental effects on soils and ecosystems.

During rainfall events, water that reaches the surface is stored in depressions or infiltrates into the soil. When the soil is unable to take in more water, the excess moves downslope to areas of

concentrated flow resulting in overland flow erosion. The result is on- and off-site consequences that can adversely affect the form and function of terrestrial and aquatic ecosystems. The immediate on-site net effect of erosion is loss of productivity that may alter the capability of the land to support plant and animal species and off-site problems may develop because of sediment deposition.

Eroded soil particles moved and deposited by a watercourse are known as sediment, which can adversely alter water quality, habitats, and the hydrologic form and function of waterways and wetlands. Suspended sediment in waterways inhibits light penetration and photosynthesis and diminishes the aesthetic value of water bodies. Sediment deposition in waterways leads to premature filling of water bodies, exertion of large oxygen demands on the water, burial of benthic organism aquatic habitats, and alteration of stream hydrology. Introduction of sediments and the other pollutants into ecosystems at accelerated rates resulting from human activities can adversely impact terrestrial and aquatic environments, damage or destroy cultural resources, reduce recreation use and value of affected watersheds, and increase land management and operating costs.

Sediment deposition on other terrestrial systems can bury and kill vegetation and other organisms. Environmental damage potentials may be further expounded by the introduction of materials such as organic matter and soil-bound nutrients, pesticides, metals, or other compounds to receiving ecosystems. Sedimentation directly and indirectly impacts threatened and endangered wildlife and vegetation by altering habitats to a point that may exclude its use by species of concern.

Areas of the reservation that are wooded have less of an erosion potential for all of the soil series as compared to cleared areas (such as test ranges). Cleared areas have a higher susceptibility to soil erosion from water and wind (U.S. Air Force, 1996). The U.S. Department of Agriculture (USDA) Soil Conservation Service has recommended the following preparations for maximum soil protection: 1) permanent vegetation, 2) grassed waterways, 3) gully control structures, and 4) terraces (U.S. Air Force, 1996).

3.1.3 Chemical Resources – Gulf of Mexico

Gulf waters contain many dissolved ions, principally, chlorine, sodium, magnesium, calcium, potassium, bromine, boron, strontium, fluorine, carbonate, and sulfate (Petrucci, 1982). However, only six of these components make up 99 percent of the dissolved solids in the water: sodium, chlorine, magnesium, sulfur, potassium, and calcium (Millersville University, 1996). Table 3-2 identifies typical concentrations of various chemical constituents of the eastern Gulf waters.

3.1.4 Meteorology

The Eglin Military Complex is located in an area that is subject to warm, subtropical weather that lasts almost nine months out of the year and is characterized by an abundance of sunshine and rainfall, warm and humid summers, and mild winters. The climate in the local area may be considered semitropical, being dominated by maritime tropical air during the summer and continental polar air during the winter. There are two major seasons, summer and winter. Summer occurs from April through September and is characterized by high humidity and frequent air mass type thunderstorms. Winter occurs from September through March and is

characterized by prevailing northerly winds with fairly frequent frontal passages or periods under the influence of semi-stationary frontal zones.

Table 3-2. Chemical Composition of Seawater Typical of the Gulf of Mexico

Components*	Concentration (ppt)
Major	
Chloride	19.00
Sodium ion	10.50
Magnesium ion	1.35
Sulfate	0.89
Calcium	0.40
Potassium ion	0.39
Minor	
Bromide	0.065
Carbonate/Inorganic Carbon	0.028
Strontium	0.008
Borate	0.005
Silica	0.003
Fluoride	0.001
Aluminum ion	0.000005

* Other trace elements: nitrogen, iodine, phosphorus, iron, zinc, manganese, gold, and organic carbon compounds
ppt = parts per thousand
Source: Lerman, 1986

The proximity of Choctawhatchee Bay and the Gulf of Mexico, coupled with the upward sloping terrain, causes a land/sea breeze cycle that impacts Eglin and results in the formation of a line of showers and thunderstorms almost daily during the summer. This line of coastal thunderstorms forms parallel to the coast 5 to 25 miles inland depending on the sea breeze strength. On any day that solar heating raises the land temperature above the Gulf temperature, a sea breeze will form. Under normal conditions, the sea breeze will start around 1000 hours local, and then cease rapidly after sunset. At night, under similar conditions, when the land cools to a lower temperature than the Gulf, a land breeze develops. The land breeze usually begins around 2300 hours local and dies shortly after sunrise. This flow is the dominant weather situation during the summer months and is observable to some extent throughout the year.

Eglin AFB is vulnerable to tropical storms that originate off North Africa and in the Caribbean. The Atlantic hurricane season runs from 15 April through 30 November. In the Eglin area, the most likely months are August through October. Historically, this area experiences gale-force winds an average of once every three years and hurricane-force winds an average of once every six years. Weather associated with hurricanes includes tornadoes, high winds, and extremely heavy rain.

Overall, the Choctawhatchee Bay and the Gulf of Mexico moderate the climate of Eglin AFB by tempering the cold northern winds of winter and causing cool sea breezes during the daytime in the summer. The average annual temperature at Eglin is 68 degrees Fahrenheit (°F). Average monthly temperatures range from 51°F in January to 82°F in July and August. The highest average daily maximum temperature is 89°F in July and August and the lowest average daily temperature is 42°F in January. Annual rainfall averages approximately 62 inches, occurring primarily in the summer and late winter or early spring. Historically, the heaviest rainfall occurs during July at an average of 7.7 inches, and the lowest occurs in October at an average of

3.5 inches. Most of the summer rainfall is from scattered showers and thundershowers that are often heavy and last only one or two hours.

Prevailing winds are usually from the north in winter and from the south in summer with an annual average wind speed of five knots (Kts). January, February, March, April, and December are the windiest months with an average wind speed of six knots. July and August have the lowest average velocity winds at four knots. During summer, a moderate sea breeze usually blows off the Gulf of Mexico, and occasional strong winds come from thunderstorms.

The characteristic patterns of local air movement in the Eglin area are illustrated by the annual wind rose shown in Figure 3-3 and the three-month wind roses provided in Figures 3-4 and 3-5. Wind roses are compass-type plots of the frequencies of wind speeds and directions over a specified period. The wind rose provides a graphical description of the prevailing winds giving the frequency of occurrence (percent occurrence) of different wind speed and wind direction combinations for a specific location and over a given time period. It shows the number of wind speed and direction observations, expressed as a percentage, which had a particular direction and speed during the summary period. Wind roses are shown here because the potential drift of the B61 JTA upon release and impacts by prevailing winds. These figures indicate expected wind direction and speed, which can be used to determine timing of test operations such that the drift would be minimized.

The wind rose diagram represents conditions as they converge on the center from each direction of the compass. The "spokes" or "arms" on the wind rose graph represent 16 points of the compass and point to where the wind was coming from. The percentage of time the wind blew *from* a given direction (without regard to speed) can be determined from a percent scale located on the wind rose. For a particular wind direction, the length of each segment on a spoke represents the percentage of time the wind was within a particular wind speed interval. If a specific wind speed interval were summed for all wind directions, the result would be the percentage of all hours the wind speed was measured within that particular interval. The percentage of time during which the wind was light and/or calm is provided separately on the wind rose.

3.1.5 Tides

Compared to the Atlantic and Pacific coasts, Gulf coast tides are small and less developed, with a range usually less than 0.7 meter (ESE et al., 1987; Weber et al., 1992). Gulf tides may be diurnal (one high and one low daily); semi-diurnal (two highs and two low tides daily); or varying combinations of the two (Weber et al., 1992). Local fluctuations in tidal heights may result from strong winds, large storms, and hurricanes (Weber et al., 1992). The southwest Florida shelf tidal regime is mixed, composed of diurnal and semi-diurnal components (ESE et al., 1987).

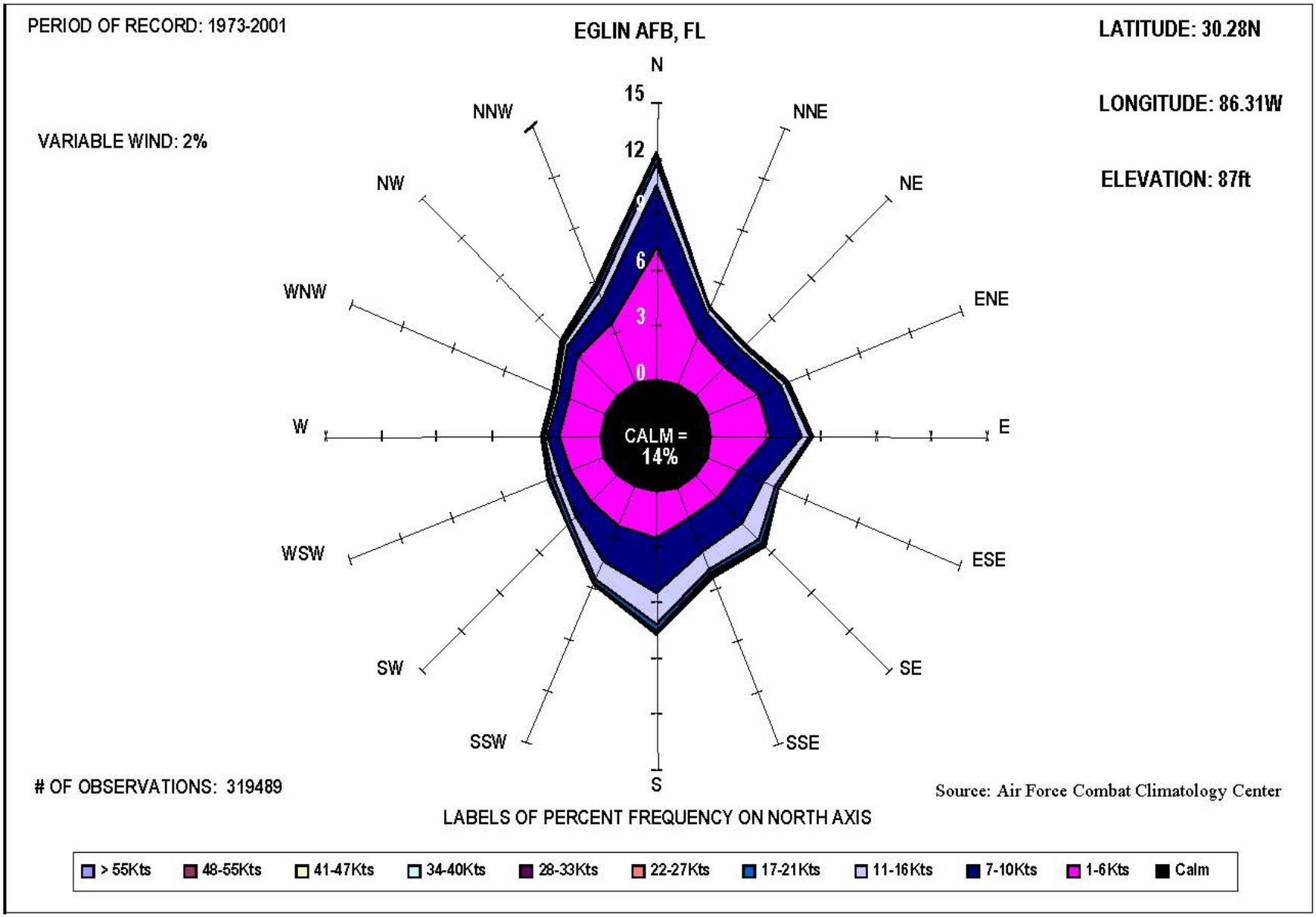

Figure 3-3. Annual Wind Rose for the Eglin Area

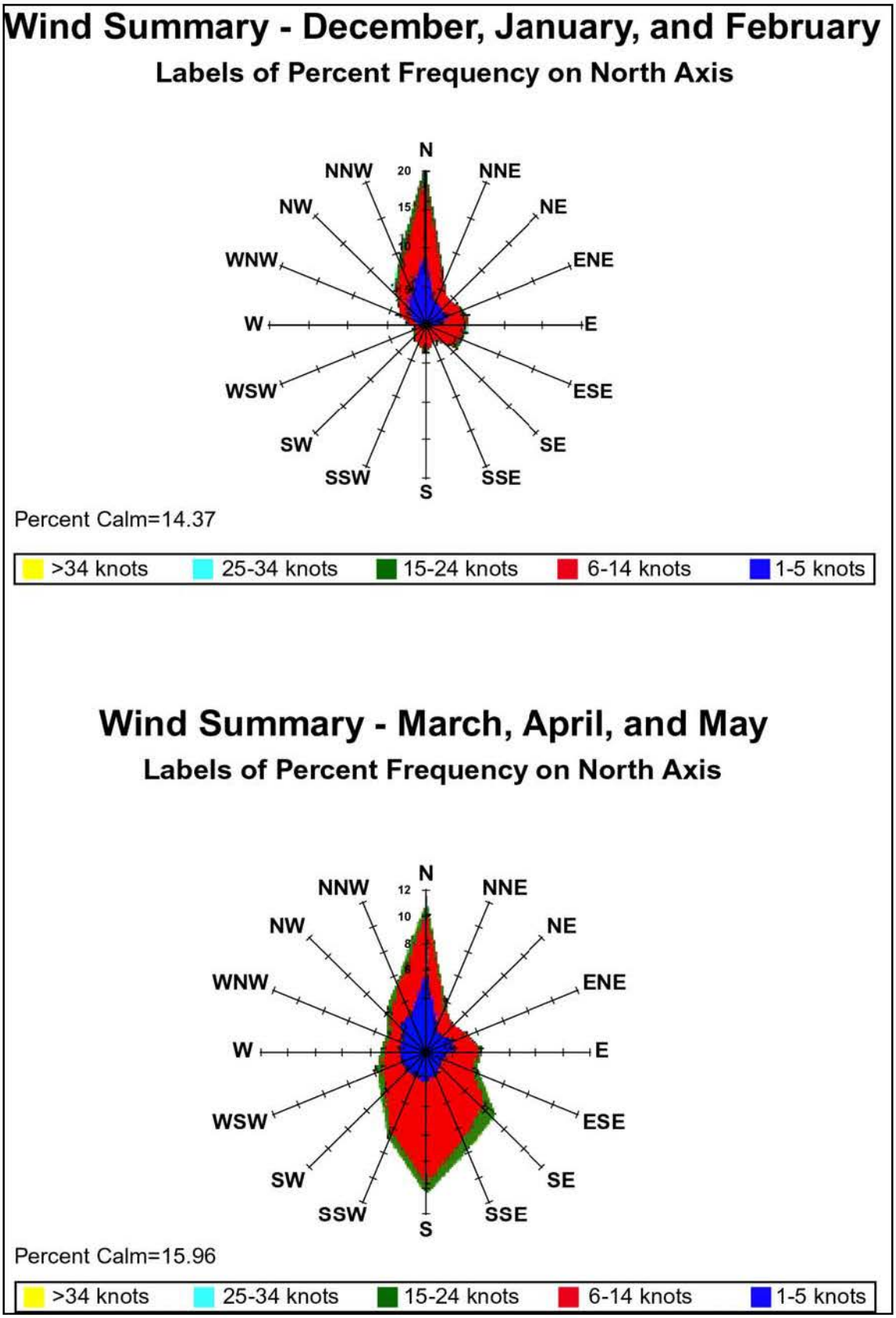

Figure 3-4. Wind Roses for the Eglin Area for December to February (Top) and March to May (Bottom)

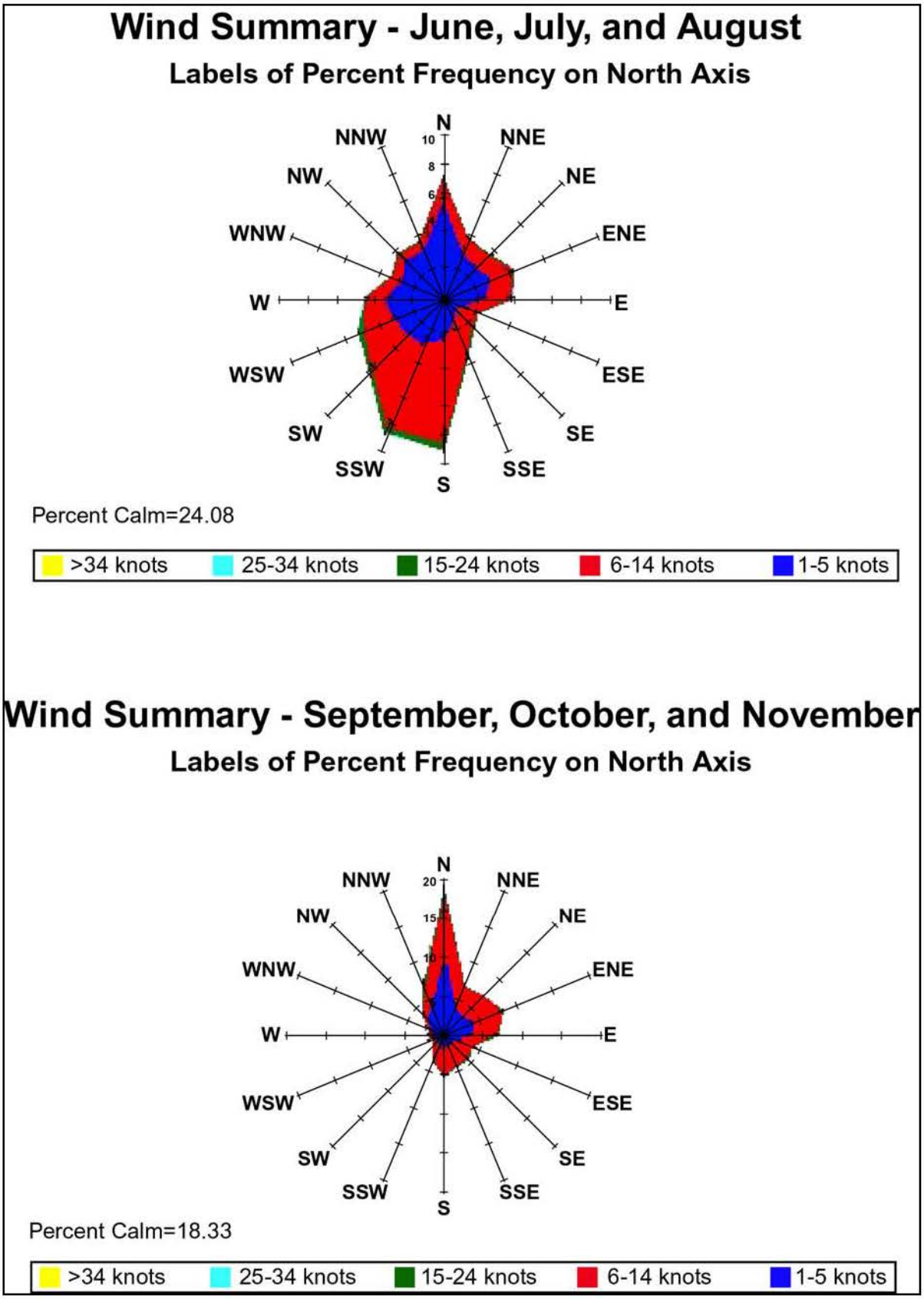

Figure 3-5. Wind Roses for the Eglin Area from June to August (Top) and September to November (Bottom)

3.2 BIOLOGICAL RESOURCES

Biological resources include the native and introduced terrestrial plants and animals on Eglin AFB. The land areas at Eglin are home to unusually diverse biological resources including several sensitive species, habitats, and wetlands. Eglin uses a classification system based on ecological associations that were developed based on floral, faunal, and geophysical characteristics. These ecological associations are described in the *Eglin AFB Integrated Natural Resources Management Plan* (*INRMP*) (U.S. Air Force, 2002) and the *Environmental Baseline Study Resource Appendices* (U.S. Air Force, 1995).

3.2.1 Ecological Associations on Test Areas B-70 and C-52C

Ecological associations provide habitat for birds, reptiles, amphibians, fish, and mammals. The characterizations provided below are not comprehensive or exclusive listings since the species utilize a variety of communities (U.S. Air Force, 1995). Ecological associations found on TAs B-70 and C-52C are discussed in this section and presented in Figure 3-6 and Figure 3-7.

Open Grassland/Shrubland Ecological Association

Nearly 95 percent of TA B-70 and approximately 80 percent of TA C-52C is characterized by the Open Grassland/Shrubland ecological association. Open grassland/shrublands are typical of locations that are artificially maintained, as is most of TA B-70. The Open Grassland/Shrubland ecological association is actually a specialized association that occurs within disturbed Sandhill ecological association test sites (U.S. Air Force, 1995). Mechanical methods and fire are employed to remove and prevent reestablishment of tall vegetation. Riparian zones are found throughout these areas.

Sandhills Ecological Association

About 5 percent of TA B-70 is Sandhills. Due to the vegetation management practices employed on TA B-70, the Sandhills Ecological Association is only characteristic of the narrow test area perimeter regions and regions immediately adjacent to Live Oak Creek. Sandhills are underlain by Lakeland soils, which are deep, sandy, and well-drained, creating a dry condition. This ecological association is typically characterized by rolling sandhill ridges dissected by streams. It includes pockets of habitat ranging from steeply sloped to flat and xeric (dry) to mesic (moist) (U.S. Air Force, 1995).

Wetlands and Riparian Ecological Association

Wetlands and Riparian ecological associations on Eglin AFB are divided into four categories: (1) Wetlands which are dominated by plants adapted to anaerobic substrate conditions imposed by saturation or inundation for more than 10 percent of the growing season, (2) lacustrine wetlands that occur in nonflowing wetlands of natural depressions, (3) riverine communities, which are natural, flowing waters from their source to the downstream limits of tidal influence and are bounded by channel banks, and (4) estuarine communities found along bays and bayous and consist of brackish waters.

Streams draining Test Areas B-70 and C-52C are classified as seepage streams, which are characterized as perennial or intermittent seasonal water courses, originating from shallow ground waters that have percolated through deep, sandy, upland soils. These streams are typically clear too lightly colored, and are relatively short, shallow, and narrow. Live Oak Creek runs north to south through the center of B-70 (Figure 3-8). Basin Creek runs in a southeasterly direction from the central boundary of C-52C to the southeast corner of the test area (Figure 3-9).

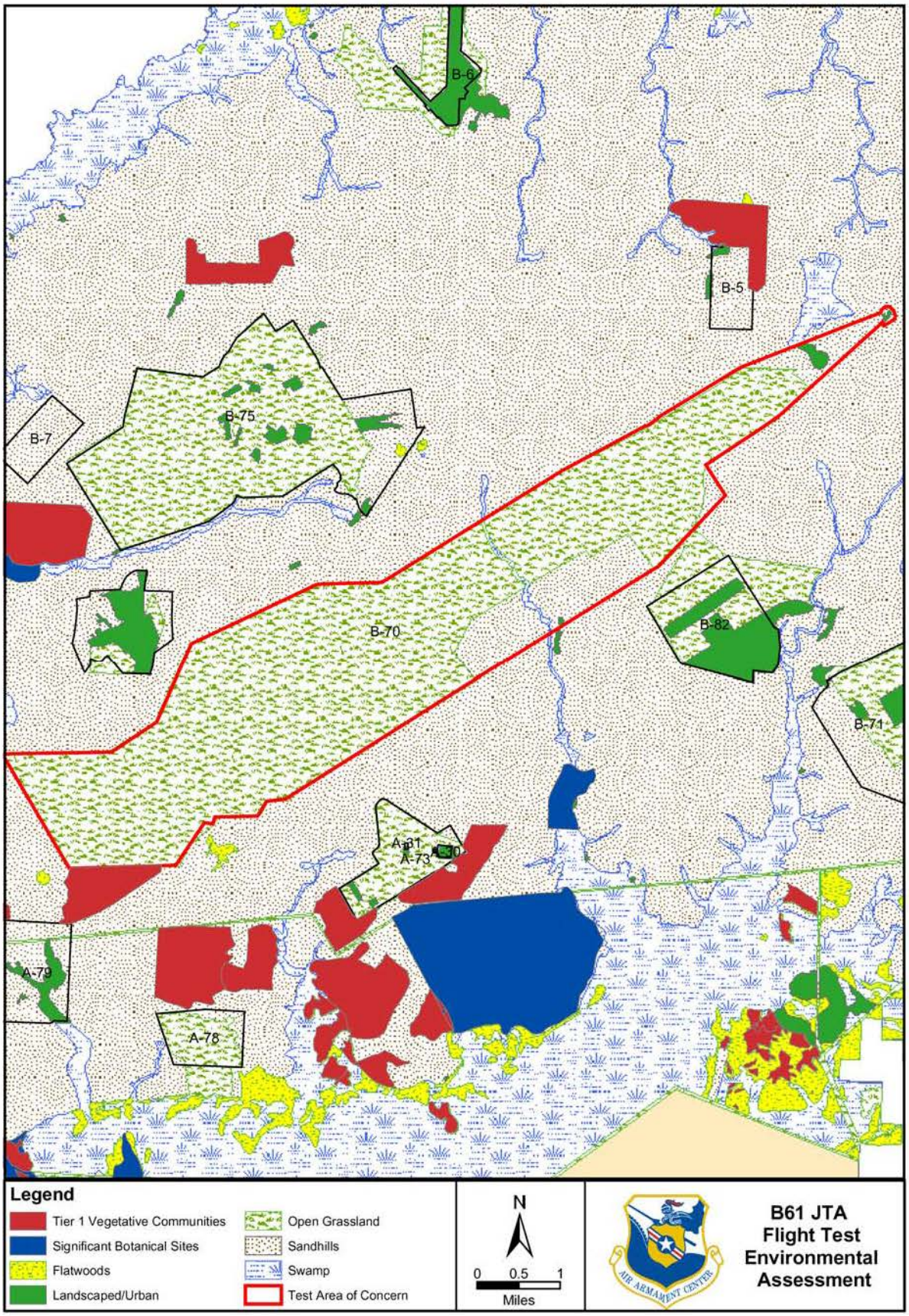

Figure 3-6. Ecological Associations Found on TA B-70

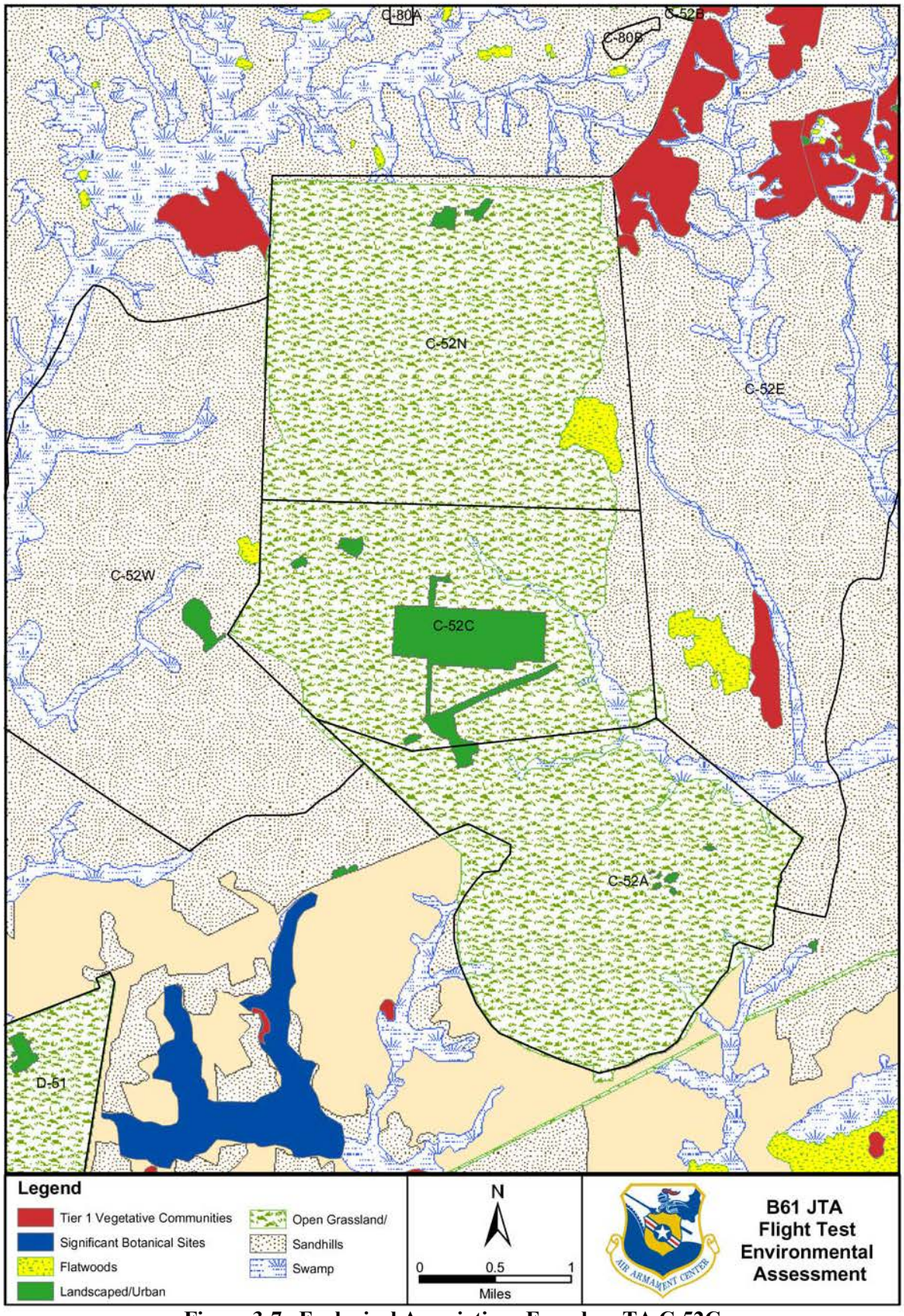

Figure 3-7. Ecological Associations Found on TA C-52C

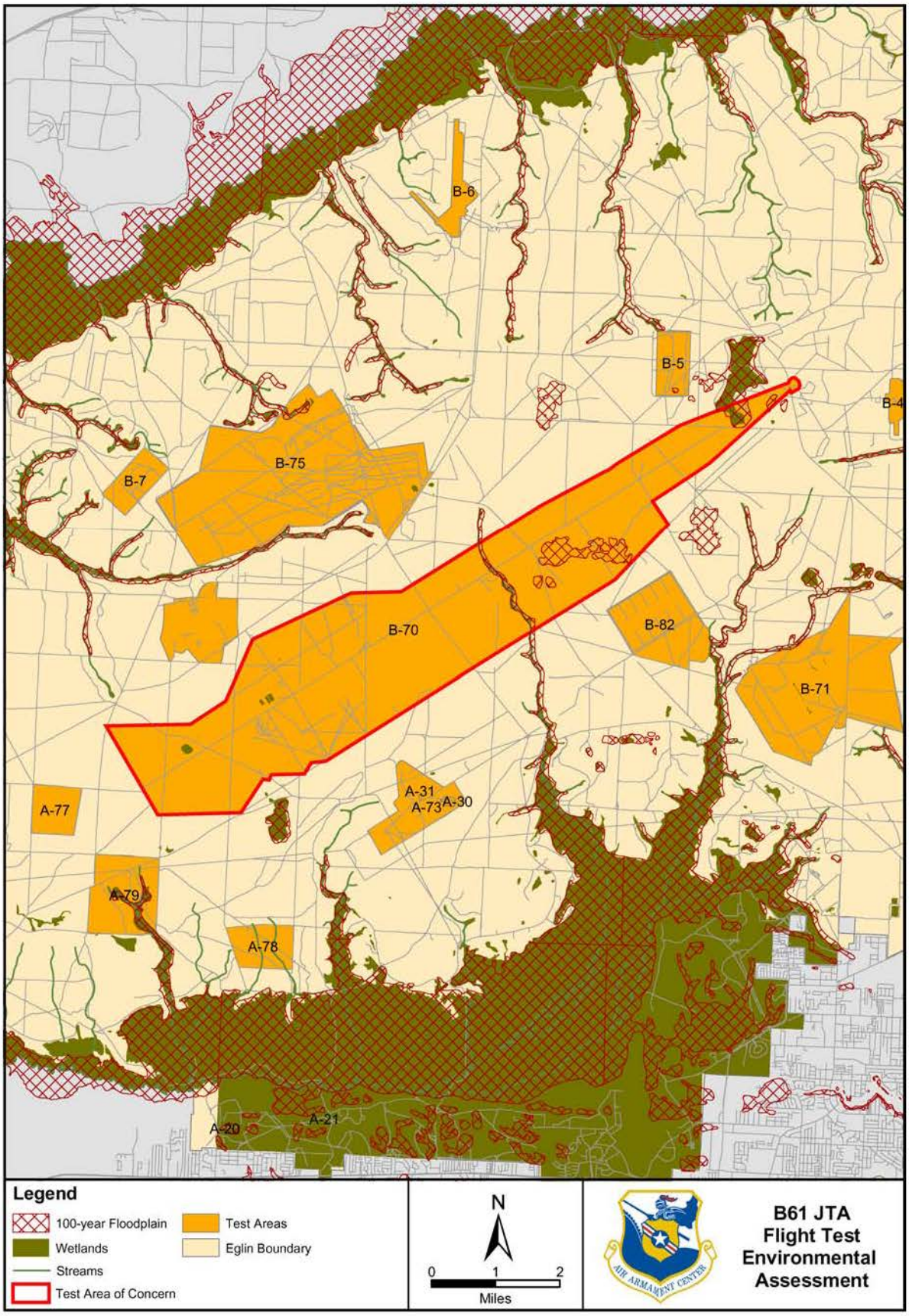

Figure 3-8. TA B-70 Wetlands and Streams

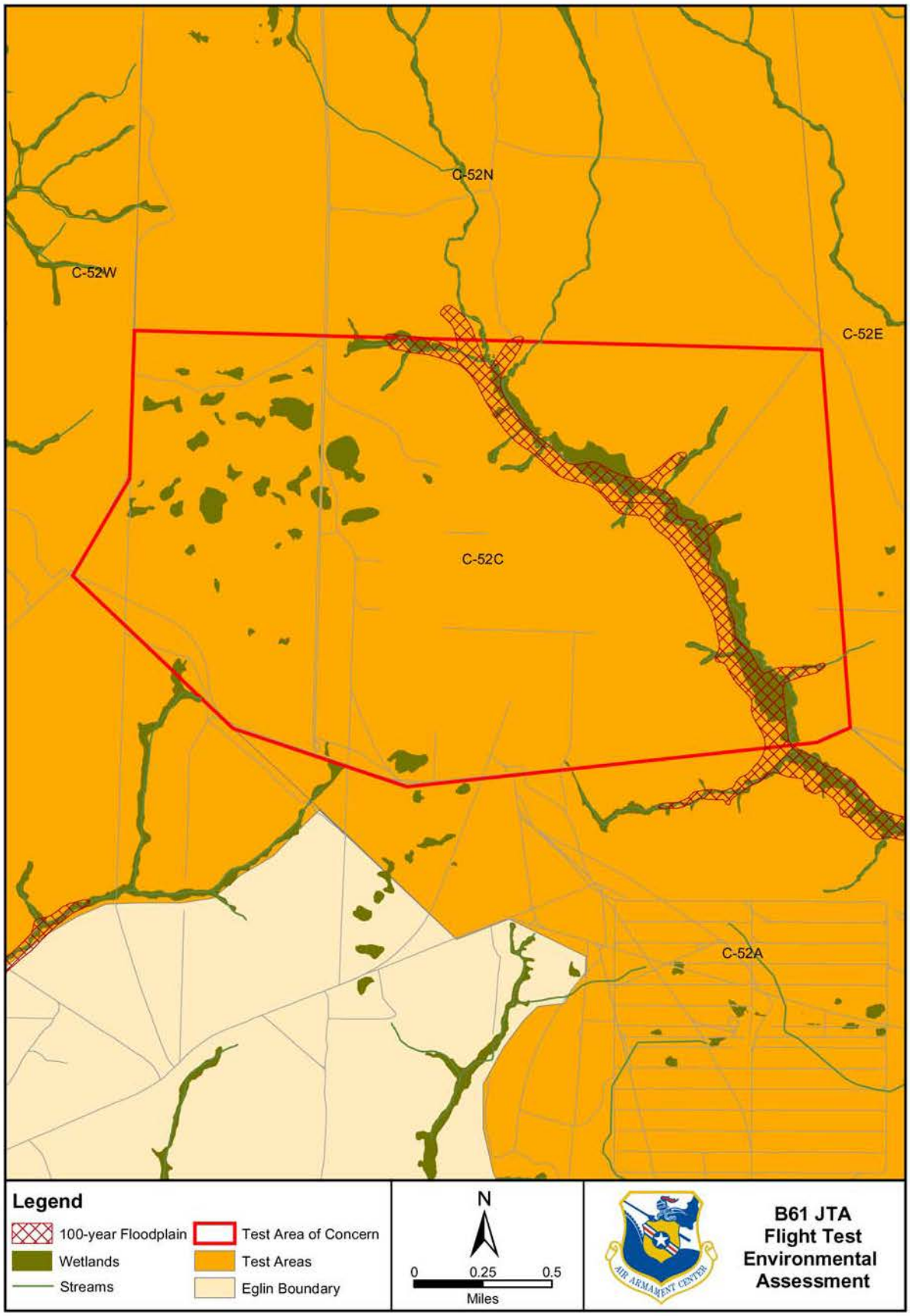

Figure 3-9. TA C-52C Wetlands and Streams

Landscaped/Urban Ecological Association

The Landscaped/Urban ecological association exists on Test Area C-52C. These areas are located in the middle of C-52C as well as along the lower middle boundary and at the upper western boundary. Landscaped/Urban areas often possess exotic species and are intensely managed. Fertilizer and herbicides are used to control nonnative grasses and planted trees in this ecological association (U.S. Air Force, 2001).

Plants and Animals Typically Found in Ecological Associations

Table 3-3 provides a summary of some of the plant and animal species typically found within the ecological association described previously. The list below should not be considered a comprehensive inventory of the species found within these ecological associations. Rather, the table is provided as a reference summary.

3.2.2 Sensitive Habitats

Sensitive habitats found on or adjacent to TAs B-70 and C-52C include Florida Natural Areas Inventory (FNAI) Tier I vegetative communities, wetlands, and floodplains. The management of sensitive habitats is the responsibility of AAC/EMSN, Natural Resources Branch of the Environmental Management Directorate.

Tier I Communities

The mission of the FNAI is to collect, interpret, and disseminate ecological information critical to the conservation of Florida's biological diversity. FNAI maintains a state-wide database on the distribution, status, and management of exemplary natural communities; endangered and rare plants and animal taxa; and managed areas in Florida. FNAI classifies land areas into the following four-tiered classification system (FNAI, 1995).

***Tier I*:** Vegetative communities that are in or closely approximate their natural state and undisturbed condition. The goal of management is to maintain the natural community.

***Tier II*:** Vegetative communities that retain a good representation and distribution of associated species typical of the undisturbed state, but have been exposed to moderate amounts and intensities of disruptive events. Through careful management, the community may be restored or maintained.

***Tier III*:** Vegetative communities that do not retain good representation and distribution of associated species and have been exposed to severe amounts and intensities of disruptive events. Significant and intensive management (pine plantations, etc.) over extended periods would be required to restore these communities.

***Tier IV*:** Areas on Eglin that have a designated land use, such as test areas, developed areas, sewage disposal areas, roads, power line rights-of-way, and other uses. The nature of the designated use determines the management goal.

Table 3-3. Typical Plant and Animal Species of the Eglin Land Test and Training Ranges

Common Name	Scientific Name	Common Name	Scientific Name
Sandhills Ecological Association			
Long Leaf Pine	*Pinus palustris*	Red-cockaded Woodpecker	*Picoides borealis*
Turkey Oak	*Quercus laevis*	Bobwhite Quail	*Colinus virginianus*
Blackjack Oak	*Q. marilandica*	Great Horned Owl	*Bubo virginianus*
Bluejack Oak	*Q. incana*	Gopher Tortoise	*Gopherus polyphemus*
Wiregrass	*Aristida stricta*	Indigo Snake	*Drymarchon corais*
Saw Palmetto	*Serona repens*	Diamondback Rattlesnake	*Crotalus adamanteus*
Bracken Fern	*Pteridium aquilinum*	Six-lined Racerunner	*Cnemidophorus sexlineatus*
Blueberry	*Vaccinium* spp.	Florida Black Bear	*Ursus americanus floridanus*
Yaupon	*Ilex vomitoria*	Fox Squirrel	*Sciurus niger*
Gallberry	*Ilex glabra*	Least Shrew	*Cryptodus parva*
Gopher Apple	*Licania michauxii*	Cottontail Rabbit	*Sylvilagus floridanus*
Open Grassland/Shrubland Ecological Association			
Switch Grass	*Panicum virgatum*	Slender Glass Lizard	*Ophisaurus attenuatus*
Broomsedge	*Andropogon* spp.	Box Turtle	*Terrapene carolina* subspp.
Bluestem	*Schizachyrium* spp.	Gopher Tortoise	*Gopherus polyphemus*
Lovegrass	*Eragrostis* spp.	Black Racer	*Coluber constrictor*
Woolly Panicum	*Dichanthelium acuminatum*	Diamondback Rattlesnake	*Crotalus adamanteus*
Scrub Oak	Quercus spp.	Eastern Coachwhip	*Masticophis flagellum flagellum*
Southeastern American Kestrel	*Falco sparverius paulus*	Indigo Snake	*Drymarchon corais*
Great Horned Owl	*Bubo virginianus*	Gopher Frog	*Rana capito sevosa*
Screech Owl	*Otus asio*	Cotton Mouse	Peromyscus gossypi
Red-shouldered Hawk	*Buteo lineatus*	Oldfield Mouse	*Peromyscus polionotus*
Florida Burrowing Owl	*Athene cunicularia*	Cottontail Rabbit	*Sylvilagus floridanus*
Wetland and Riparian Ecological Association			
(Freshwater)			
Yellow Water Lilly	spp.	Raccoon	*Procyon lotor*
Saw Grass	*Cladium jamaicensis*	Florida Black Bear	*Ursus americanus floridanus*
Cattail	*Typha domingensis*	Sherman's Fox Squirrel	*Sciuris niger shermani*
Phragmites	*Phragmites australis*	American Alligator	*Alligator mississippiensis*
White Cedar	*Chamaecyparis thyoides*	Pine Barrens Tree Frog	*Hyla andersonii*
Water Tupelo	*Nyssa biflora*	Five-lined Skink	*Eumeces fasciatus*
Pitcher Plant	*Sarracenis purpurea*	Green Anole	*Anolis carolinensis*
Red Titi	*Cyrilla racemiflora*	Garter Snake	*Thamnophis sirtalis*
Tulip Poplar	*Liriodendrom tulipifera*	Indigo Snake	*Drymarchon corais*
Sweet Bay Magnolia	*Magnolia virginiana*	American Beaver	*Castor canadensis*
Red Bay	*Persea borbonia*	Parula Warbler	*Parula americana*
Landscaped/Urban			
Native Blue Jay	*Cyanocitta cristata*	Raccoon	*Procyon lotor*
Cardinal	*Cardinalis cardinalis*	Opossum	*Didelphis virginiana*
American Crow	*Corvus brachyrhynchos*	White-tailed Deer	*Odocoileus virginianus*
Coyote	*Canis latrans*	Non-native English house sparrow	*Passer domesticus*
European Starling	*Sturnus vulgaris*		

This classification system has been applied to reservation land at Eglin AFB. Consequently, several Tier I communities have been identified. Tier I hydric/mesic communities are the most sensitive to degradation since they are wetlands. A 317-acre Tier I Sandhill community borders the extreme southeast corner of TA B-70; no Tier I areas are located within the test area (Figure 3-10). No Tier I areas are located on or within 1 kilometer (km) of TA C-52C (Figure 3-11).

Wetlands

Wetland areas are sensitive habitat that are inundated (water covered), or where water is present either at or near the surface of the soil for distinguishable periods of time throughout the year. Local hydrology and soil saturation largely affects soil formation and development, as well as the plant and animal communities found in wetland areas. Hydric (wet), anaerobic (lacking oxygen) sediments resulting from the presence of water typify wetlands.

Wetlands support both aquatic and terrestrial organisms. Large varieties of microbes, vegetation, insects, amphibians, reptiles, birds, fish, and mammals can be found living in concert in wetland ecosystems. Through a combination of high nutrient levels, fluctuations in water depth, and primary productivity of plant life, wetlands provide the base of a complex food web, supporting the feeding and foraging habits of these animals for part of or all of their life cycle. During migration and breeding, many nonresident and transient bird and mammal species also rely on wetlands for food, water, and shelter. Wetland areas are located in the northwest corner of Test Area C-52C (Figure 3-9) and in the south central portion of B-70 (Figure 3-8).

The U.S. Army Corps of Engineers (USACE) Wetland Delineation Manual defines wetlands as "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (USACE, 1987). All jurisdictional wetlands in the United States meet three wetland delineation criteria (hydrophytic vegetation, hydric soils, and wetland hydrology) and are protected under Section 404 of the Clean Water Act (33 USC Section 1344) and its implementing regulations found in 40 Code of Federal Regulations 230. Wetlands on federal lands are further protected under Executive Order (EO) 11990, which states "...each federal agency shall provide leadership and shall take action to minimize the destruction, loss or degradation of wetlands...." FDEP's wetland program regulates dredge and fill activities in waters under their jurisdiction. Permit applications made to the FDEP can also serve as joint applications to initiate concurrent review by the USACE.

Floodplains and the Coastal Zone Management Act

Floodplains are lowland areas adjacent to surface water bodies (i.e., lakes, wetlands, and rivers) that are periodically covered by water during flooding events. Floodplains carry and store floodwaters during flood events. Floodplains and riparian habitat are biologically unique and highly diverse ecosystems providing a rich diversity of aquatic and terrestrial species, acting as a functional part of natural systems. Floodplain vegetation and soils act as water filters, intercepting surface water runoff before it reaches lakes, streams, or rivers. This process aids in the removal of excess nutrients, pollutants, and sediments from the water and helps reduce the need for costly cleanups and sediment removal. Floodplains also reduce downstream flooding by increasing upstream storage in wetlands, sloughs, back channels, side channels, and former channels.

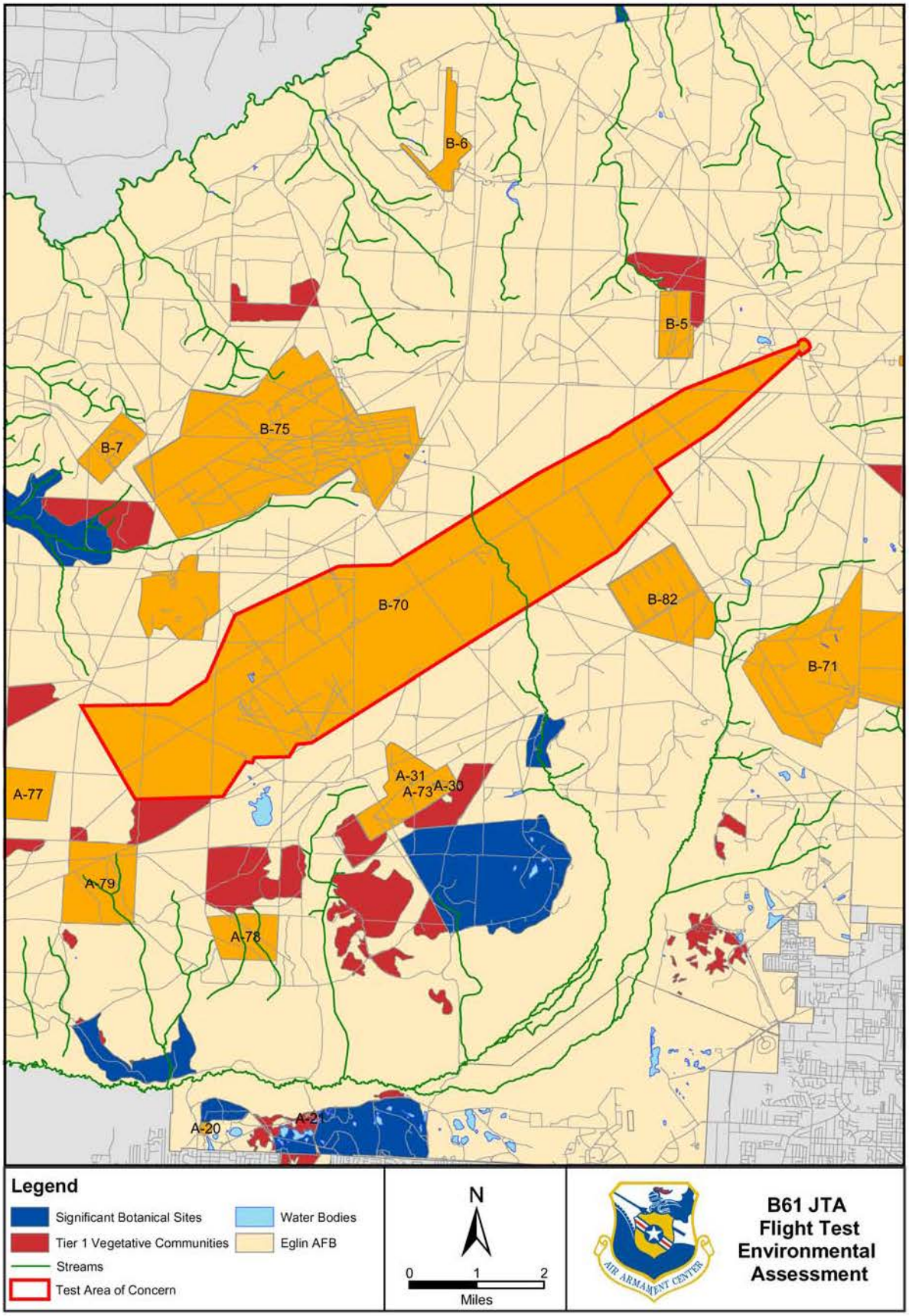

Figure 3-10. TA B-70 Botanical and Natural Areas

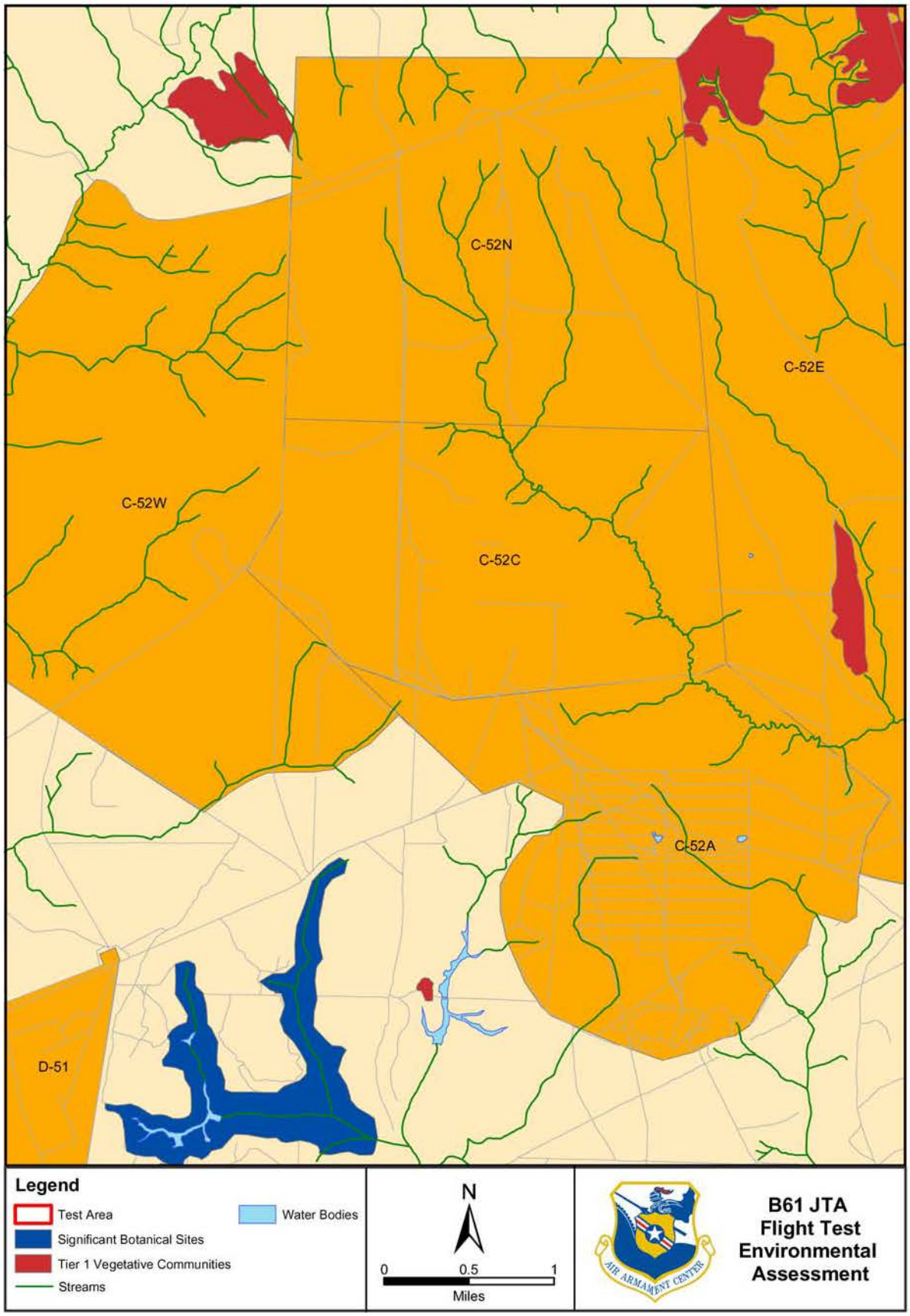

Figure 3-11. TA C-52C Botanical and Natural Areas

Flooding on Eglin AFB could occur as a result of rainfall within the base's drainage basins, hurricanes, or a combination of both. The majority of the installation is above the Federal Emergency Management Agency (FEMA) 100-year flood zone; however, extensive flood-prone areas occur along the Yellow River drainage system and the East Bay Swamp. Most of the perennial streams on base are included within areas expected to be inundated by 100-year floods. The 100-year floodplain is considered a Wetland Resource Area under the Wetlands Protection Act. Floodplain is found adjacent to Basin Creek on TA C-52C (Figure 3-9). There is also floodplain adjacent to Live Oak Creek on TA B-70, and to the east of Live Oak Creek in a low-lying area (Figure 3-8).

The term "coastal zone" is defined as coastal waters and adjacent shorelands strongly influenced by each other and in proximity to the several coastal states, and including islands, transitional and intertidal areas, salt marshes, wetlands, and beaches. "Coastal waters" are defined as any waters adjacent to the shoreline that contain a measurable amount of sea water, including but not limited to sounds, bays, lagoons, bayous, ponds, and estuaries. The outer boundary of the coastal zone is the limit of state waters, which for the Gulf coast of Florida is 9 nautical miles from shore. The Proposed Action is to be conducted within Eglin airspace and land ranges. As such, some components of this action would take place within the jurisdictional concerns of the Florida Department of Environmental Protection and therefore would require a consistency determination with respect to Florida's Coastal Zone Management Plan and the Coastal Zone Management Act.

Any actions being considered by federal agencies must be evaluated to determine whether they would occur within a floodplain. Floodplains that must be considered include those areas with a 1 percent chance of being inundated by floodwater in a given year (also known as a 100-year floodplain). Executive Order (EO) 11988, Floodplain Management (Federal Register, 1977a), requires federal agencies to avoid adverse impacts associated with the occupancy and modification of floodplains and to avoid floodplain development whenever possible. Additionally, EO 11988 requires federal agencies to make every effort to reduce the risk of flood loss, minimize the impact of floods on human health, safety, and welfare, and preserve the natural beneficial value of floodplains. The order stipulates that federal agencies proposing actions in floodplains consider alternative actions to avoid adverse effects, avoid incompatible development in the floodplains, and provide opportunity for early public review of any plans or proposals. If adverse effects are unavoidable, the proponent must include mitigation measures in the action to minimize impacts.

Parts of the floodplain that are also considered wetlands will, in addition to floodplain zonings, receive protection through federal, state, and local wetland laws. These laws, such as the U.S. Army Corps of Engineers Section 404 Permit Program, regulate alterations to wetlands to preserve both the amount and integrity of the nation's remaining wetland resources. Executive Order 11990, Protection of Wetlands (Federal Register, 1977b), places additional requirements on floodplains when considered as wetlands. It requires federal agencies to avoid undertaking or providing assistance for new construction located in wetlands unless there are no practicable alternatives and all practicable measures to minimize harm to wetlands have been implemented. It also precludes federal entities from leasing space in wetland areas unless there are no practicable alternatives.

The Coastal Zone Management Act (CZMA) provides for the effective, beneficial use, protection, and development of the U.S. coastal zone. Federal agency activities in the coastal zone are required to be consistent to the maximum extent practicable with approved state Coastal Zone Management Plans. Federal agencies make determinations whether their actions are consistent with approved state plans and submit these determinations for state review and concurrence (Appendix B). All relevant state agencies must review the Proposed Action and issue a consistency determination. The Florida Coastal Management Program is composed of 23 Florida statutes administered by 11 state agencies and four of the five water management districts.

3.2.3 Sensitive Species

An endangered species is one that is in danger of extinction throughout all or a significant portion of its range. A threatened species is any species that is likely to become endangered within the future throughout all or a significant portion of its range due to factors such as loss of habitat and anthropogenic effects. A candidate species is one for which the U.S. Fish and Wildlife Service (USFWS) has on file sufficient information on biological vulnerability to warrant a listing, but the listing is precluded at the present time. Once legally protected, it is a federal offense to "take" (import, export, kill, harm, harass, possess, or remove) protected animals from the wild without a permit. Federal candidate species should be given consideration during planning of projects, but have no protection under the Endangered Species Act. Similar regulations are in place for state-listed species (endangered, threatened, or species of special concern).

Under 16 USC 1531 to 1544; 1997-Supp; Endangered Species Act 1973 (ESA), Federal agencies must ensure that their actions (including permitting) do not jeopardize the continued existence of any endangered or threatened species or destroy or adversely modify the habitat of such species without a permit, and must set up a conservation program. A Section 7 consultation with the USFWS or the National Marine Fisheries Service (NMFS) would be required if a take, which is defined as pursuing, molesting, or harming a protected species, were to occur. If the Proposed Action were likely to adversely affect a federally protected species, the USFWS would determine whether jeopardy or non-jeopardy to the species population would occur. As a result, Air Force projects that may affect, either directly or indirectly, federally protected species, species proposed for federal listing, or critical habitat for protected species are subject to Sections 7 and 10 of the Endangered Species Act prior to the irreversible or irretrievable commitment of resources (U.S. Air Force, 1995). Eglin has developed an overall goal within the Integrated Natural Resources Management Plan to continue to protect and maintain populations of native threatened and endangered plant and animal species within the guidelines of ecosystem management (U.S. Air Force, 2002). Sensitive species potentially occurring within the region of influence of the Proposed Action are outlined in Table 3-4. Locations of sensitive species on and near TAs B-70 and C-52C are shown in Figures 3-12 and 3-13. A description of sensitive species is located in Appendix B.

Table 3-4. Sensitive Species on B-70 and C-52C

Scientific Name	Common Name	Status*	Location
Amphibians			
Ambystoma cingulatum	Flatwoods salamander	FT, SSCC	C-52C
Rana capito sevosa	Dusky gopher frog	SSC	B-70, C-52C
Rana okaloosae	Florida bog frog	SSC	B-70
Fish			
Etheostoma okaloosae	Okaloosa darter	FE, SE	C-52C
Reptiles			
Alligator mississippiensis	American alligator	FT(S/A), SSC	NONE
Drymarchon corais couperi	Eastern indigo snake	FT, ST	B-70, C-52C
Gopherus polyphemus	Gopher tortoise	SSC	B-70, C-52C
Macroclemys temmincki	Alligator snapping turtle	SSC	NONE
Pituophis melanoleucus	Florida pine snake	SSC	B-70, C-52C
Birds			
Falco sparverius paulus	Southeastern American kestrel	ST	B-70, C-52C
Picoides borealis	Red-cockaded woodpecker	FE, ST	B-70, C-52C
Athene cunicularia	Burrowing owl	SSC	B-70
Mammals			
Ursus americanus floridanus	Florida black bear	ST	B-70, C-52C
Plants			
Xyris longisepala	Karst pond yellow-eyed grass	SE	B-70
Magnolia ashei	Ashe's magnolia	SE	B-70
Rhodoendron austrinum	Orange azalea	SE	B-70
Magnolia pyramidata	Pyramid magnolia	SE	B-70
Stewartia malacodendron	Silky camellia	SE	B-70
Kalmia latifolia	Mountain laurel	ST	B-70
Illicium floridanum	Florida anise	ST	B-70
Carex baltzellii	Baltzell's Sedge	ST	C-52C
Lachnocaulon dignum	Bog Buttons	SE	C-52C
Panicum nudicaule	Naked-stemmed Panic Grass	ST	C-52C
Baptisia calycosa var villosa	Pineland wild indigo	Unknown	C-52C
Lilium iridollae	Panhandle lily	SE	C-52C
Tephrosia mohrii	Pineland Hoary Pea	ST	C-52C
Sarracenia rubra	Red-flowered Pitcher Plant	SE	C-52C

*Status has been verified through FNAI
C= Federal candidate species
FE = Federally endangered
FT = Federally threatened
FT(S/A) = Federally threatened due to similarity of appearance to another species
SE = State endangered
SSC = State species of special concern
SSCC = State species of special concern candidate
ST = State threatened

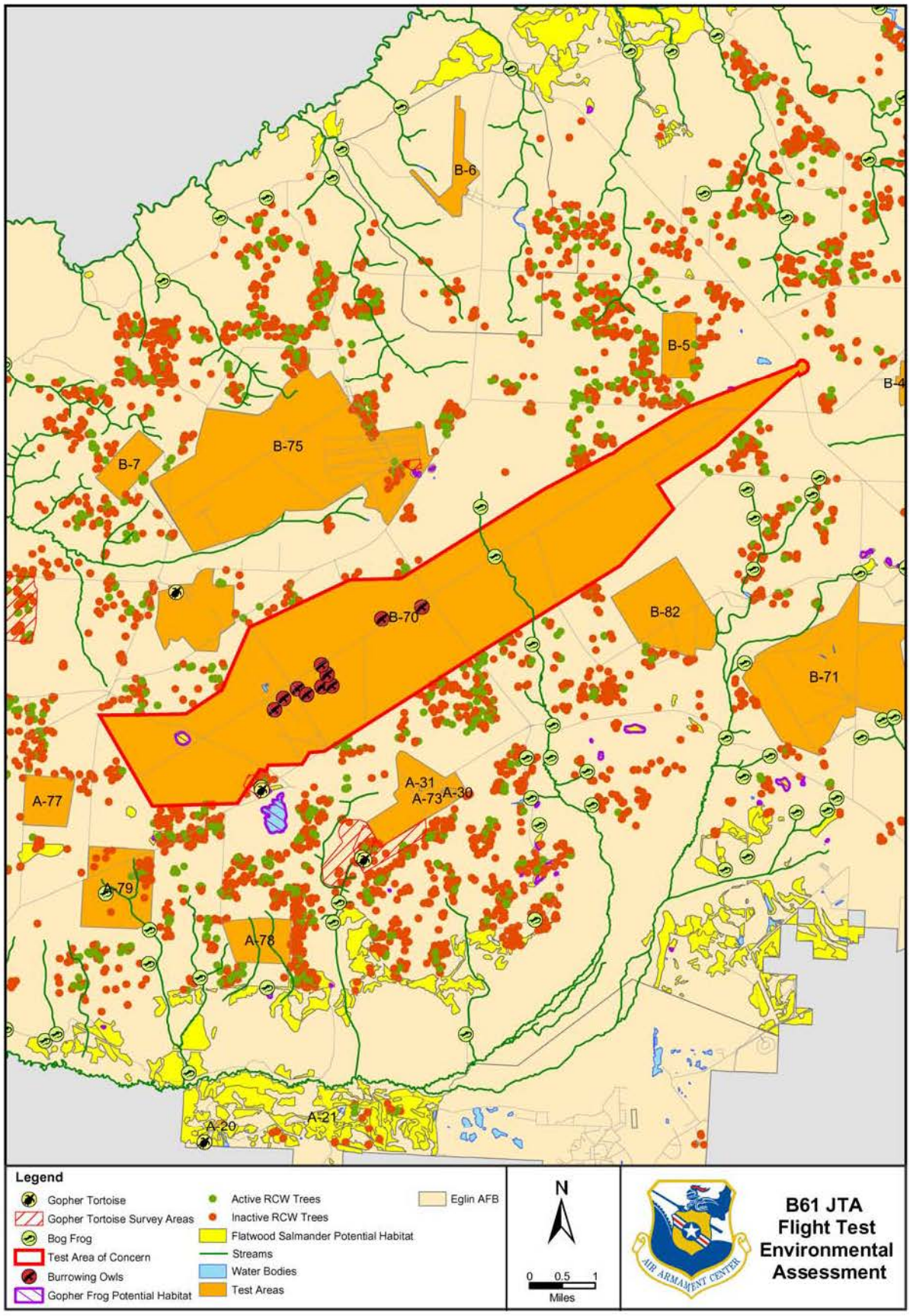

Figure 3-12. TA B-70 Sensitive Species

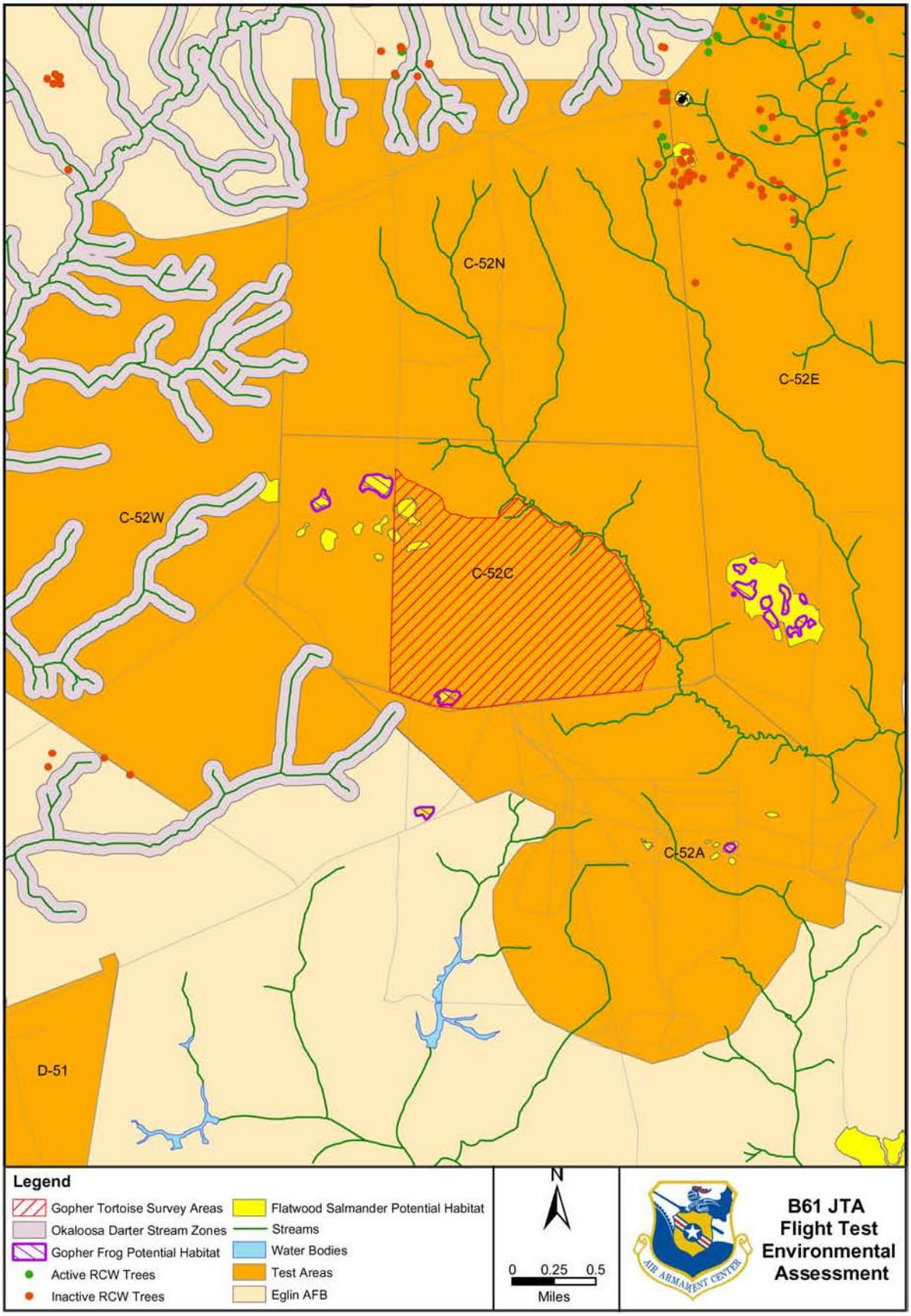

Figure 3-13. TA C-52C Sensitive Species

Gulf of Mexico Biological Resources

This section gives a summary of the plankton community, invertebrates, fishes, marine and neotropical birds, marine mammals, threatened, endangered, and special status species, and special biological resources of the nearshore marine waters of the eastern Gulf.

Plankton Community

Plankton are free-floating microscopic organisms that include plant and animal species. The three general groups comprising plankton are bacterioplankton, phytoplankton, and zooplankton. Plankton is essential to the Gulf food chain, ultimately affecting fish and marine mammals.

Invertebrates

Oceanic invertebrate fauna include benthic fauna associated with the sediments and free-swimming pelagic animals. Benthic invertebrates include the infauna, which are animals living in the substrate (such as burrowing worms and mollusks), and the epifauna, which are animals that live on the substrate (such as mollusks, crustaceans, hydroids, sponges, and echinoderms). Benthic invertebrates are usually described in terms of species composition, density, and faunal associations. At least 1,497 species of epibiota, (plants and animals living on the substrate) including mollusks (20 percent), crustaceans (19 percent), fishes (15 percent), algae (11 percent), cnidarians (10 percent), echinoderms (8 percent), sponges (6 percent), and others (11 percent) have been collected from live bottom stations on the Florida shelf just below W-168. Over 90 species of sponges and 53 species of scleractinian coral have been identified (Phillips et al., 1990).

Fishes

The eastern Gulf provides a wide variety of resources for fishes to inhabit and utilize. These resources are dependent upon their physical and chemical environment, including variables such as salinity, temperature, depth, bottom type, primary productivity, oxygen content, turbidity, and currents. Table 3-5 illustrates the more common fishes of the eastern Gulf.

Fishes of the eastern Gulf may be characterized by where they live in the water column. Benthic and reef fishes live at the bottom of waters and around artificial or natural reef systems. Pelagic fishes, which spend most of their lives in the open waters of the Gulf, make seasonal, latitudinal migrations along the west coast of Florida. These migrations are caused by seasonal changes in temperature, movement of their food resources, and spawning instincts. King and Spanish mackerel leave their wintering areas in south Florida and move northward in the spring along the continental shelf. Both species spawn over the continental shelf from northwestern Florida to the northwestern Gulf off Texas. The shallow portion of the shelf at the high nutrient areas near river plumes is likely used for nursery areas (MMS, 1990).

Table 3-5. Common Fishes of the Eastern Gulf of Mexico

	Scientific Family Name	Common Name
Temperate	*Acipenseridae*	Sturgeons
	Atherinidae	Silversides
	Clupeidae	Herring, menhaden
	Cyprinodontidae	Mummichogs, killifishes
	Engraulidae	Anchovies
	Exocoetidae	Flying fishes
	Percichthyidae	Striped bass
	Pomatomidae	Bluefish
Subtropical	*Albulidae*	Bonefish
	Carangidae	Jacks
	Ephippidae	Spadefish
	Holocentridae	Squirrelfishes
	Istiophoridae	Marlins
	Labridae	Wrasses
	Lutjanidae	Snappers
	Mullidae	Goatfish
	Scaridae	Parrotfish
	Sciaenidae	Drums
	Scombridae	Mackerel, bonito, tunas
	Serranidae	Groupers
	Sparidae	Porgies
	Xiphiidae	Swordfish
Tropical	*Centropomidae*	Snooks
	Chaetodontidae	Butterflyfish, angelfish
	Coryphaenidae	Dolphinfish
	Elopidae	Tarpon
	Gerreidae	Mojarras
	Lutjanidae	Snappers
	Pomacentridae	Damselfish
	Pomadasyidae	Grunts
	Rachycentridae	Cobia
	Sciaenidae	Drums
	Sphymidae	Hammerhead sharks
	Sphyraenidae	Barracudas

Migratory and Nonmigratory Birds

The eastern Gulf is a migratory route for numerous bird species. Approximately two-thirds of the breeding bird species of the eastern United States migrate to Central and South America, Mexico, and the Caribbean (Keast and Morton, 1980). Some important resting areas for migratory birds include St. Andrew State Recreation Area, Gulf Islands National Seashore, St. Joseph Peninsula State Park, and St. George Island State Park (Duncan, 1994). Some of the migrant species of this region are summarized in Table 3-6 (Fisher, 1979; Fritts and Reynolds, 1981; Duncan, 1991). All migratory birds are protected under the Migratory Bird Treaty Act, originally passed in 1918 (USFWS, 1996).

Table 3-6. Migratory Birds Found in the Eastern Gulf of Mexico

Wading and Shore Birds	Land Birds and Birds of Prey	Waterfowl	Pelagic Birds
Upland sandpiper	Peregrine falcon	Blue-winged teal	Shearwaters
White-rumped sandpiper	Ruby-throated hummingbird		Storm petrels
Semipalmated sandpiper	Blackpoll warbler		Boobies
Eastern kingbird	Chimney swift		Tropic birds
Cattle egret	Mourning doves		Phalaropes
Piping plover			Bridled terns
Snowy plover			Black terns
Black skimmer			
Least tern			

Many nonmigratory (resident) birds are found in or near the eastern Gulf all year. They do not migrate to other geographical areas as the seasons change. The brown pelican, a bird familiar to everyone in the eastern Gulf, has been removed from the federal endangered species list in Florida, but remains a species of special concern (MMS, 1990; Florida Game and Freshwater Fish Commission, 1994). The double-crested cormorant (*Phalacrocorax auritus*), common throughout North America, is a marine bird that usually stays and breeds near the coast (Fritts and Reynolds, 1981; Udvardy, 1985). Laughing gulls (*Larus atricilla*) and royal terns (*Sterna maxima*) have been sighted in both the winter and summer seasons (Fritts and Reynolds, 1981). The frigatebirds (*Fregata magnificens*) may be observed along the coast and seldom go far from land. They can be seen at any time of the year and have been spotted over waters between 25 and 50 meters deep (Fritts and Reynolds, 1981; Duncan, 1991; Udvardy, 1985).

Marine Mammals

All cetaceans are protected by the Marine Mammal Protection Act (MMPA, 1972, as amended 1988) administered by National Oceanic and Atmospheric Administration (NOAA)/National Marine Fisheries Service (NMFS) and USFWS. Offshore species are under the jurisdiction of the NMFS.

Marine mammal species that potentially occur within the Proposed Action area include two species of cetaceans and one sirenian, the West Indian manatee. During winter months, manatee distribution in the Gulf of Mexico is generally confined to southern Florida. During summer months, a few may migrate north as far as Louisiana. However, manatees primarily inhabit coastal and inshore waters, and rarely venture offshore. Therefore, effects on manatees are considered very unlikely, and the discussion of marine mammal species is confined to cetaceans.

Cetacean abundance estimates for the study area are derived from GulfCet II (Davis et al., 2000) aerial surveys of the continental shelf within the Minerals Management Service Eastern Planning Area, an area of 70,470 square kilometers (km^2). Texas A&M University and the National Marine Fisheries Service conducted the surveys from 1996 to 1998. Cetaceans inhabiting the study area may be grouped as odontocetes (toothed whales, including dolphins) or mysticetes (baleen whales). Most of the cetaceans occurring in the Gulf are odontocetes and only members of this classification occur in the B61 JTA target area. Cetaceans considered to be common in the Gulf of Mexico include the Atlantic bottlenose dolphin (*Tursiops truncatus*), pantropical spotted dolphin (*Stenella attenuata*), Atlantic spotted dolphin (*Stenella frontalis*), and striped dolphin (*Stenella coeruleoalba*). Of these, the Atlantic bottlenose dolphin and the Atlantic

spotted dolphin may be found in the JTA testing region. Table 3-7 lists the cetacean species identified in GulfCet II aerial surveys expected to be in the study site. The table provides surface density and abundance estimates for both species. Species descriptions are located in Appendix B.

Table 3-7. Cetacean Statistics from Surveys of the Continental Shelf (1996-98)

Species	n	S	D	N
Bottlenose dolphin	58	7.3	14.798	1,824
Atlantic spotted dolphin	8	31.8	8.890	1,096
Totals			23.668	2,920

Source: Davis et al., 2000
n = number of groups, S = mean group size, D = animals/100 km^2, N = abundance estimate

Threatened, Endangered, and Special Status Species

This section will discuss the threatened, endangered, and special status species that may potentially be found in the Proposed Action area. Requirements of the Endangered Species Act are detailed under the mainland sensitive species section. The Gulf of Mexico is an ecosystem that provides habitat for many threatened, endangered, and special status species. Within the Proposed Action area, it is possible that federally listed species may be encountered, including four sea turtle species (green, loggerhead, Kemp's ridley, and leatherback), and one marine mammal species (West Indian manatee). The federally threatened Gulf sturgeon is discussed, though it is not known how far out in the Gulf it travels. The state of Florida lists the brown pelican (*Pelecanus occidentalis*) as a species of special concern. A summary of federal and state listed species is presented in Table 3-8.

Table 3-8. Summary of Federally Listed Species Known to Occur in Waters of the Target Area

Species	Status*	Areas of Occurrence
FISH		
Gulf sturgeon *Acipenser oxyrhynchus desotoi*	FT, SSC	Lives predominately in the northeastern Gulf of Mexico; may venture out to 20 miles during the winter. Moves inland to spawn from April to June.
REPTILES		
Atlantic green sea turtle *Chelonia mydas*	FE, SE	Inhabits open water and hard bottoms of marine environment. Nests within the ROI from May to August.
Kemp's Ridley sea turtle *Lepidochelys kempi*	FE, SE	Smallest and most endangered of the sea turtles. Inhabits open water. Does not nest within ROI, but does occur in ROI waters.
Leatherback sea turtle *Dermochelys coriacea*	FE, SE	Inhabits open water and hard bottoms of marine environment. Nests within ROI from May to August.
Atlantic loggerhead sea turtle *Dermochelys coriacea*	FT, ST	Inhabits open water and hard bottoms of marine environment. Hatchlings often associated with *Sargassum* rafts. Nests within the ROI from April to October.
Hawksbill sea turtle *Eretmochelys imbricata*	FE, SE	Open water. Does not nest within ROI.
MAMMALS		
West Indian Manatee *Trichechus manatus*	FE, SE	Herbivorous aquatic mammals. Diet consists mainly of water hyacinth, hydrilla, turtle grass, manatee grass, and shoal grass. Usually occurs south of Suwannee River, but has been sighted in northwest Florida.

*FE = Federal endangered, FT = Federal threatened, SE = State endangered, ST = State threatened, SSC = State species of special concern

Special Biological Resource Areas

Special Biological Resource Areas are offshore habitats that contain both unique flora and fauna. These may be areas that are important as feeding grounds, critical habitats, or principal places of productivity in the Gulf of Mexico. They are all unique ecosystems and support a large variety of species, many still unidentified. They can be found on the continental shelf, slope, and deep sea floor within the eastern Gulf. The eastern Gulf also contains many hardbottom areas, which typically consist of a hard substrate of living and nonliving carbonate reef structures. Although scattered regions of hard bottoms exist throughout the continental shelf and shallower slope areas of the eastern Gulf, none are present in the Proposed Action area. Seagrass beds are another important habitat for numerous species that occur within the Gulf; however, they are not present in Proposed Action area.

3.3 ANTHROPOGENIC RESOURCES

The anthropogenic resources described include restricted access and air space, safety and bioenvironmental hazards, and chemical materials.

3.3.1 Air Space

This section discusses the use and management of the airspace, which supports aviation activities over the Gulf of Mexico, in the Eglin Gulf Test and Training Range, and in the military training airspace used by multiple user groups.

Airspace management is defined as the direction, control, and handling of flight operations in the volume of air that overlies the geopolitical borders of the United States and its territories. Airspace is a resource managed by the Federal Aviation Administration (FAA), which has established policies, designations, and flight rules to protect aircraft in the airfield and enroute environment, and in special use airspace areas identified for military and other governmental activities. Management of this resource considers how airspace is designated, used, and administered to best accommodate the individual and common needs of military, commercial, and general aviation. Because of these multiple, and sometimes competing demands, the FAA considers all aviation airspace requirements in relation to airport operations, Federal Airways, Jet Routes, military flight training activities, and other special needs to determine how the National Airspace System (NAS) can best be structured to satisfy all user requirements.

The FAA has designated four types of airspace above the United States. They are: Controlled, Special Use, Other, and Uncontrolled airspace.

- Controlled airspace is categorized into five separate classes: Class A, B, C, D, and E airspace. These classes identify airspace that is controlled, airspace supporting airport operations, and designated airways affording enroute transit from place-to-place. They also indicate pilot qualification requirements, rules of flight that must be followed, and the type of equipment necessary to operate within that airspace.
- Special Use Airspace (SUA) is designated airspace within which flight activities are conducted that requires confinement of participating aircraft, or place operating

limitations on nonparticipating aircraft. Prohibited Areas, Restricted Areas, Warning Areas, and Military Operations Areas (MOAs) are examples of SUA.

- Other airspace consists of advisory areas, areas that have specific flight limitations or designated prohibitions, areas designated for parachute jump operations, Military Training Routes (MTRs), and Aerial Refueling Routes (ARs).
- Uncontrolled airspace is designated Class G airspace and has no specific prohibitions associated with its use.

Federal Regulations

Executive Order 10854 extends the responsibility of the FAA to the overlying airspace of those areas of land or water outside the jurisdictional limit of the United States. Under this order, airspace actions must be consistent with the requirements of national defense, must not be in conflict with any international treaties or agreements made by the United States, nor be inconsistent with the successful conduct of the foreign relations of the United States. Accordingly, actions concerning airspace beyond the jurisdiction limit (12 nautical miles) require coordination with the FAA, the DoD, and the Department of State.

Part 5 of FAA Order 7400.2E contains the policy, procedures, and criteria for the assignment, review, modification, and revocation of special use airspace overlying water (i.e., warning areas). A warning area is airspace of defined dimensions over international waters that contain activity that may be hazardous to nonparticipating aircraft. The term "warning area" is synonymous with the International Civil Aviation Organization (ICAO) term "danger area" (Federal Aviation Administration, 2001).

U.S. Air Force Regulations

U.S. Air Force airspace management is prescribed by the U.S. Air Force Instruction (AFI) 13-201, *U.S. Air Force Airspace Management* (20 March 2001), which applies to all active duty, reserve, and Air National Guard units having operational and/or administrative responsibilities for using airspace and navigational aids and local airspace guidance in the Air Armament Center Instruction 11-201, *Air Operations*, (5 April 2002). This policy applies to each Major Command (MAJCOM) functioning as the U.S. Air Force component of a unified command and to specified commands as outlined in unified or specified command directives. AFI 13-201 covers aeronautical matters governing the efficient planning, acquisition, use, and reporting of airspace actions to support U.S. Air Force flight operations.

Environmental Actions

AFI 13-201 contains policy that all airspace actions are subject to environmental analysis in order to comply with the National Environmental Policy Act (NEPA) (Public Law 91-190) as implemented in 32 CFR 989, 2003, *The Environmental Impact Analysis Process* (EIAP), March 2003. The procedures to implement NEPA and the Council on Environmental Quality (CEQ) regulations regarding the establishment, designation, and modification of special use airspace are contained in a Memorandum of Understanding between the FAA and the DoD contained in FAA Handbook 7400.2.

32 CFR 989, 2003, contains policies, responsibilities, and procedures for the U.S. Air Force EIAP within the United States, its territories, and abroad, applying to all U.S. Air Force activities and the Air National Guard. Airspace-related actions conducted within the United States and its territories that qualify for categorical exclusions (CATEXs) from environmental review include:

- Relocation of a small number of aircraft to an installation with similar aircraft that does not result in a significant increase of total flying hours or the total number of aircraft operations, a change in flight tracks, or an increase in permanent personnel or logistics support requirements at the receiving installation.
- Temporary (for less than 30 days) increases in air operations up to 50 percent of the typical installation aircraft operation rate, or increases of 50 operations per day, whichever is greater.
- Flying activities that comply with the federal aviation regulations, that are dispersed over a wide area, and that do not frequently (more than once per day) pass near the same ground points. This CATEX does not cover regular activity on established routes or within special use airspace.
- Supersonic flying operations over land and above 30,000 feet mean sea level (MSL), or over water and above 10,000 feet MSL and more than 15 nautical miles from land.
- Formal requests to the FAA or host-nation equivalent agency to establish or modify special use airspace (for example) and military training routes for subsonic operations that have a base altitude of 3,000 feet above ground level or higher. The environmental planning function (EPF) must document application of this CATEX on AF Form 813, which must accompany the request to the FAA.
- Adopting airfield approach, departure, and en route procedures that do not route air traffic over noise-sensitive areas, including residential neighborhoods or cultural, historical, and outdoor recreational areas. The EPF may categorically exclude such air traffic patterns at or greater than 3,000 feet above ground level regardless of underlying land use.
- Participating in "air shows" and fly-overs by U.S. Air Force aircraft at non-Air Force public areas after obtaining FAA coordination and approval.
- Conducting U.S. Air Force "open houses" and similar events, including air shows, golf tournaments, home shows, and the like, where crowds gather at an U.S. Air Force installation, so long as crowd and traffic control, etc., have not in the past presented significant safety or environmental impacts.

All other airspace-related actions that have the potential to significantly affect the environment are subject to a higher level of environment review (environmental assessment or environmental impact statement), under the provisions of 32 CFR 989, 2003.

Over Water Airspace

Eglin AFB controls 127,868 total square miles (mi^2) of airspace, of which 2.5 percent (3,226 mi^2) is over land and 97.5 percent (124,642 mi^2) is over water. Eglin AFB supported over 73,000 air operation sorties (an individual flight of one aircraft) during FY00, which were accomplished

predominately over the eastern Gulf of Mexico. This overwater airspace is referred to as the Eglin Gulf Test and Training Range (EGTTR) and is under the authority of the FAA, but is scheduled and operated by Eglin AFB. The EGTTR is composed of DoD controlled airspace and FAA controlled airspace available on request with an established Letter of Authorization. The EGTTR is sometimes referred to as the "Eglin Water Range."

Types of Airspace

Currently, the EGTTR comprises Warning Areas W-151, W-168, W-174, and W-470, as well as Eglin Water Test Areas (EWTA) 1 through 6. The EGTTR is defined in the AAC Instruction (AACI) 11-201, Air Operations, dated 8 September 2000. This airspace description is further defined in a "Letter of Authorization" between the Jacksonville, Houston, and Miami Air Route Traffic Control Centers (ARTCCs), Training Air Wing Six, and AAC, dated (revised) 20 May 1998.

The EGTTR is the DoD's largest water test range in the continental United States. The overwater airspace ROI in the Gulf of Mexico, south of Eglin AFB, is divided into three categories: Warning Areas, Eglin Water Test Areas (EWTA), and Controlled Firing Areas (CFA). Figure 2-2 in Chapter 2 shows the overwater airspace ROI. They are essentially the same as Restricted Areas, but with some legal differences (Federal Register, 1996).

- Warning Areas, established beyond the three-mile limit, is airspace that may contain hazards to nonparticipating aircraft. They include W-151 and W-470. Although the activities conducted within Warning Areas may be as hazardous as those in Restricted Areas, Warning Areas cannot be legally designated as such because they are over international waters. Federal Regulation, January 1996, replaced Presidential Proclamation No. 5928, extending the territorial limit from 3 to 12 nautical miles in 1988. Special FAR 53 establishes certain regulatory warning areas within the new (3 to 12 nautical mile) territorial airspace to allow continuation of military activities while further regulatory requirements are determined. The primary purpose of Warning Areas is to warn nonparticipating pilots of the potential danger.
- EWTAs serve the same function as Warning Areas, providing airspace for hazardous aircraft flying operations including air-to-surface, air-to-air, and surface-to-air activities. All of the EWTAs lie outside the 12-mile limit of the National Airspace System and include EWTAs 1, 2, 3, 4, 5, and 6.
- CFAs contain activities that, if not conducted in a controlled environment, could be hazardous to nonparticipating aircraft. A detailed description of the CFAs is provided in the U.S. Coast Pilot, Volume 5 (Department of Commerce, 2003). The distinguishing feature of the CFA as compared to other special use airspace is that its activities are suspended immediately when spotter aircraft, radar, or ground lookout positions indicate an aircraft might be approaching the area. Use of the Santa Rosa Island Controlled Firing Area requires that the following are also scheduled: R-2915B to ensure airspace will be available to instrumentation flight rules (IFR) traffic flying along the coastline; Shoreline 5 (S-5); and any additional Warning Area(s) airspace as required for the mission.

Table 3-9 provides a listing of the relevant Warning Areas, their effective altitudes, times used, and their manager/scheduler.

Table 3-9. Warning Areas in the EGTTR

Airspace	Altitudes (feet)	Time Used		Manager/Scheduler
W-151A-D	Surface to Unlimited	Continuous	1400-0400Z	46 OSS
W-151E-F		Intermittent	Intermittent	

Source: U.S. Government, 2001

Airway/Air Traffic Control

The Warning Areas used by Eglin AFB are surrounded by numerous airways and jet routes that traverse the area. An airway is a control area or portion thereof established in the form of a corridor up to but not including 18,000 feet mean sea level (MSL), the centerline of which is defined by radio navigational aids. The routes are referred to as "V" routes, or very-high frequency omnidirectional range (VOR) airways over land, and "A" routes or low frequency/medium frequency (LF/MF) airways over water, with numbering to identify the designated route. A jet route is a route designed to serve aircraft operations from 18,000 feet above MSL up to and including flight level (FL) 450, which is approximately 45,000 feet above MSL. The jet routes are referred to as "J" routes with numbering to identify the designated route. These low-altitude airways and high-altitude jet routes lie within airspace managed by Jacksonville, Atlanta, and Houston Air Route Traffic Control Centers (ARTCCs), or Houston and Miami Oceanic Controlled Areas. Gulf Routes Q-102 and Q-105 are high-altitude oceanic jet routes that allow civilian aircraft to cross EWTAs 1 and 2. The FAA acts as an agent of the ICAO for the overwater routes.

Airspace Utilization

Table 3-10 summarizes airspace scheduled utilization and capabilities of the overwater airspace in W-151, while Table 3-11 summarizes the types of uses and users for this area.

Table 3-10. Airspace Scheduled Utilization and Capability

Airspace/Test Area	Scheduled Hours		Airspace Capability		
	FY96	FY00	T&E	Training	Space Surveillance
W-151 (A-B-C-D)	30,840*	43,469*	X	X	

Sources: U.S. Air Force, 1998b; U.S. Air Force, 2001a
* Eglin Range Utilization Report (FY96 and FY00), Table 3-18

Table 3-11. Eglin Overwater Airspace Uses and Constraints

Airspace	Land Areas Used	Uses	Constraints
W-151	None	Multi-use air-to-air, air-to-surface, surface-to-air training activities, aircraft flying activities, and T&E activities. Includes aircraft firing activities, watercraft activities, air-to-air missile activities, surface-to-air missile activities, and electronic systems test and training.	Borders coastal restricted airspace requiring close coordination with range safety to ensure weapon safety footprints stay within confines of the airspace during munitions firing/release.

Source: U.S. Air Force, 2001b

Most flight activities over the eastern Gulf of Mexico occur between 0700 and 1700 hours and from dusk to 2300 hours. The majority of flight hours over the Gulf of Mexico are used in support of proficiency and initial training for pilots.

3.3.2 Safety

Safety is the evaluation of risks to public health. With respect to the Proposed Action, risk to the health of military personnel and those measures designed to minimize that risk are also reviewed. For actions occurring in the EGTTR and Eglin land test areas with inherent safety risks, procedures are in place that minimize or eliminate altogether risks to the public. Such measures include the designation of areas as "restricted" or "closed" to the public, either permanently or temporarily. Such closures are driven by the dimensions of the "safety footprint" of a particular action that may have potentially harmful noise, blast, or other effects, or by the existence of unexploded ordnance from historical missions.

Safety Footprints

Safety footprints, and their restrictions vary based on several factors, including weapon type, flight profile, altitude, speed, or flight system of the specified test activity and whether the system will be tested above land test areas or the EGTTR.

When applying the individual weapon safety footprints to the test areas, it is the policy of the Range Safety Office (AAC/SEU) to apply a safety buffer called the impact limit line. The impact limit line is the outermost boundary of allowable surface impact of items generated by the test. In the EGTTR, the safety buffer not only protects public users from areas potentially impacted by the test activity but also buffers the activity from adjacent Gulf uses (e.g., shipping, recreational boating, commercial activities), thereby ensuring public safety and compatible use of the Gulf. The buffer can also attenuate the noise of test area activities, mitigating that impact to adjacent/surrounding user groups. Over land test areas, safety footprints would also be established to ensure the safety of on-site personnel and adjacent users.

3.3.3 Safety Regulations

The following list of standards and regulations would apply to safety for the B61 JTA Flight Test under the Proposed Action.

29 CFR 1910.120: 1996, Occupational Safety and Health Act (OSHA), Chemical Hazard Communication Program – Requires that chemical hazard identification, information and training be available to employees using hazardous materials and institutes material safety data sheets (MSDS) that provide this information.

Department of Defense Instruction 6055.1: Establishes occupational safety and health guidance for managing and controlling the reduction of radio frequency exposure.

Department of Defense Flight Information Publication: Identifies regions of potential hazard resulting from bird aggregations or obstructions, military airspace noise sensitive locations, and defines airspace avoidance measures.

Air Force Instruction 32-7063: 01 March 1994, Air Installation Compatible Use Zone Program (AICUZ) – The AICUZ study defines and maps potential accident zones and runway clear zones around the installation, and contains specific land use compatibility recommendations based on aircraft operational effects and existing land use, zoning, and planned land use.

Air Force Manual 91-201: 12 January 1996, Explosives Safety Standards – Regulates and identifies procedures for explosives safety and handling as well as defining requirements for ordnance quantity distances, safety buffer zones, and storage facilities.

Air Force Instruction 91-301; 1-Jun-96; Air Force Occupational and Environmental Safety, Fire Protection and Health (AFOSH) Program; Identifies occupational safety, fire prevention, and health regulations governing Air Force activities and procedures associated with safety in the workplace.

3.3.4 Restricted Access and Socioeconomics

The following sections describe socioeconomic conditions within the study region in the Gulf of Mexico. Socioeconomic conditions at B-70 (or C-52C under Alternative 2) will not be discussed as they would not be affected by the activities on the land test areas. Socioeconomic conditions in the Gulf of Mexico include commercial and recreational fisheries, commercial shipping/traffic, commercial air traffic, military activity, energy exploration and development, recreational activities, and cultural and historical regions.

Recreation

The northern Gulf of Mexico coastal zone is one of the major recreational regions of the United States, particularly for marine fishing and beach activities. Its resources include coastal beaches, barrier islands, coral reefs, estuarine bay and sounds, river deltas, and tidal marshes. Many of these are held in trust for the public under federal, state, and local jurisdiction (i.e., parks, landmarks). Commercial facilities such as resorts and marinas are also primary areas for tourist activity.

Outdoor recreational activity in the Gulf is primarily located along the shoreline and is associated with accessible beach areas. Beaches are a major focal point for tourism as well as a primary source of recreational activity for residents.

Fishing

The Gulf waters are estimated to support more than one third of the nation's marine recreational fishing, with over 2.6 million anglers in 2000 who caught an estimated 149 million fish during more than 20 million individual fishing trips. Nearly 104 million of the fish were caught from private/rental boats, over 7 million were caught from charter boats, and 33 million were caught from the shore (NMFS, 2001). Tourism-related dollars in the Gulf coast states contribute an estimated $20 billion to the local economy each year (USEPA, 1994). Recreational fishing activities usually occur within 3 miles of the shoreline, with anglers fishing from shore or from private or charter boats. In Destin, Florida cobia fishing tournaments may occur in late March and April, and an annual Destin Fishing Rodeo occurs in October. Cobia are fished from wrecks and artificial reefs beginning in late March. In 2000, there were 35,000 participants in the October billfishing tournament over the month long period. Table 3-12 shows the marine recreational fishing statistics for Gulf coast states in 2000.

Table 3-12. Marine Recreational Fishing Statistics for Gulf Coast States in 2000

State	No. of Fishermen	No. of Fishing Trips	No. of Fish Caught
Alabama	346, 885	1,096,852	7,471,949
Louisiana	699,540	3,653,903	39,219,520
Mississippi	223,280	1,060,902	4,910,520
West Florida	3,599,022	14,625,831	97,416,750

The Florida Gulf coast, and particularly southwest Florida, boasts diverse habitats that support several species of fish and invertebrates favored by tourist and resident fishermen (ESE, 1987). In 2001, recreational fishermen took 26 million trips in the Gulf of Mexico and these anglers caught 36.5 percent of the 444.2 million recreational fish caught. Florida and Texas were by far the leaders among the five states. Over 75 million pounds of fish were caught recreationally in 2000, with popular species being herring, seatrout, catfish, and flounder (Table 3-13) (NMFS, 2001).

Table 3-13. Estimated Total Number of Fish Caught by Marine Recreational Anglers in the Gulf of Mexico by Species Group, January–December 2000

Species Group	Thousand Pounds
Herrings	23,365
Spotted Seatrout	27,622
Saltwater Catfishes	8,941
Flounder	1,023
Red Drum	8,511
Sand Seatrout	5,934
Atlantic Croaker	5,935
Black Sea Bass	3,378
White Grunt	2,591
Red Snapper	2,182
Mullets	2,973
Kingfishes	2,411
King Mackerel	449
Bluefish	375
Spot	73
Other Fishes	53255
TOTAL	**149,018**

Source: Modified from NMFS, 2001

Species targeted by recreational anglers are generally the same targeted by the commercial fishing industry, and may be grouped as inshore, coastal pelagic, reef fishes, and offshore pelagics. Inshore species include red drum, spotted sea trout, snook, striped or black mullet, tarpon, pompano, black drum, and sheepshead. Most of these inshore species are primarily sought by recreational fishermen, with the exception of mullet and sea trout. Anglers seeking reef fishes capitalize on the abundance of larger predatory species such as snappers, groupers, grunts, porgies, barracudas, and jacks. Certain ornamental reef fishes such as angelfishes, butterflyfishes, damselfishes, gobies, and small seabass are sought for the aquarium industry. Billfish, dolphinfish, and tuna are offshore pelagics, generally fished commercially. Invertebrate species fished in the northeast Gulf are scallops, oysters and blue crab, while lobster, stone crab, and pink shrimp are fished in southwest Florida waters.

Saltwater fishing activities, both commercial and recreational, are essential for the social and economic welfare of the citizens of the Gulf coast. Greene, Moss, and Thunberg (1994) estimated the recreational reef fishery alone in Florida generates $385.6 million in total expenditures annually, approximately $12 million of which is derived from saltwater fishing license fees. Their study quantified the effects of declining catches, estimating a 20 percent reduction in average catch would reduce expenditures from saltwater anglers by $32.1 million.

Boating

Recreational boating interests include the use of sailboats, powerboats, and personal watercraft on freshwater lakes, inlets, estuaries, sounds, and in the Gulf. These watercraft activities lie almost entirely within 3 miles of the shoreline, limiting conflicts with military activities. A survey of the number of powerboats, sailboats, and personal watercraft registered along the Florida Gulf coast shows the distribution of recreational boating activity along the shoreline (Table 3-14).

Table 3-14. Distribution of Recreational Watercraft Among Florida Gulf Coast Counties

County	All Boats	Powerboats		Sailboats		Personal Watercraft	
		Pleasure	Commercia	Pleasure	Commercial	Pleasure	Commercia
Bay	16,445	14,759	1,457	227	2	1,301	524
Escambia	16,783	15,977	487	314	5	1,060	77
Franklin	2,362	1,502	827	32	1	24	0
Gulf	2,376	2,112	259	5	0	28	8
Okaloosa	15,977	14,870	822	276	9	1,652	297
Santa Rosa	8,870	8,415	325	130	0	359	87
Walton	2,673	2,572	84	17	0	27	4
TOTAL	**65,486**	**60,207**	**4,261**	**1001**	**17**	**4,451**	**997**

Source: Florida Department of Transportation, 1996

3.3.5 Commercial Fishing

The Gulf of Mexico is the single most important commercial fishing area in the United States (U.S. Department of Commerce, 1998). Commercial fishing in the Gulf of Mexico in 2000 produced over 1.79 billion pounds valued at over $990 million (Davis et al., 2000). Florida's west coast ranked third among the Gulf states of Louisiana, Mississippi, Texas, and Alabama with over 75 million pounds valued at $156 million. The major commercial ports and their dominant fisheries along the Gulf coast of Florida are Apalachicola (oysters/shrimp) with 10.3 million pounds valued at $11.4 million in 2000, Fort Myers (black mullet/shrimp) with 7.9 million pounds valued at $16.5 million in 2000, and Key West-Marathon (shrimp/lobster/king mackerel) with 16.9 million pounds valued at $50.6 million in 2000 (NMFS, 2001). Commercial fishing is generally concentrated along the coastline and extends west covering approximately one-half of the overwater ROI.

Commercially Important Species

Commercial fisheries are a valuable industry in northwest Florida, worth over $3.5 million in 1997 from Gulf County alone (FDEP, 1998). Resources within the EGTTR are more economically important than fishery resources within the 3-mile zone from the shoreline to range boundary, which is not considered part of the EGTTR. In 1993, commercial landings from 3 to 200 miles were 69 million pounds, which was 46 percent of total landings from the shoreline to

200 miles. However, the species landed in the EGTTR are more economically profitable. In 1993, the economic value of commercial fisheries from 3 to 200 miles was $106.8 million, which was 70 percent of the total value of all landings from the shoreline to 200 miles (Newlin, 1994).

The following sections describe the most commercially important species. Overall, the shrimp fishery, including pink shrimp, white shrimp, and brown shrimp is the most valuable to the Florida west coast. Other species that are valued over $1 million dollars per year are grouper and scamp, blue crab, striped mullet, and snappers (yellowtail and red) (Table 3-15).

Table 3-15. Commercially Important Fishes Within the Eastern Gulf

Common Name	Scientific Name
Sandbar Shark	*Carcharhinus plumbeus*
Dolphinfish	*Coryphaeria hippurus*
Spotted Seatrout	*Cynoscion nebulosus*
Yellowedge Grouper Black Grouper Gag Grouper	*Ephinephelus flavolimbatus* *Mycteroperca bonaci* *Mycteroperca microlepis*
Scamp	*Mycteroperca phenax*
Yellowtail Snapper	*Ocyurus chysurus*
Pink Shrimp White Shrimp Brown Shrimp	*Penaeus duorarum* *Penaeus setiferus* *Penaeus aztecus*
Cobia	*Rachycentron canadus*
King Mackerel	*Scomberomerus cavalla*
Spanish Mackerel	*Scomberomerus maculatus*
Amberjack	*Seriola dumerili*
Yellowfin Tuna	*Thunnus albacares*
Pompano	*Trachinotus carolinus*
Swordfish	*Xiphias gladius*

Source: FDEP, 1998

3.3.6 Commercial Shipping

Seven of Florida's deepwater ports are located on the Gulf: Port of Pensacola, Port of Panama City, Port St. Joe, Port of St. Petersburg, Port of Tampa, Port Manatee, and Port of Key West. Approximately 45 percent of United States' shipping tonnage passes through Gulf of Mexico ports. Major shipping routes in the Gulf are shown in Figure 3-14. The Gulf of Mexico supports the second largest marine transport industry in the world. In 1999 there were more than 234,000 trips in the Gulf of Mexico. In 1999 over 109.6 million tons of commodities were shipped through the Gulf portion of the Intercoastal Waterway (USACE, 1999). There are two deep-water ports in the five-county ROI: the Port of Pensacola in Escambia County and Port of Panama City USA in Bay County. Both of these ports are located along the Intercoastal Waterway.

The Port of Pensacola is northwest Florida's leading deep-water port and is located on the Gulf of Mexico at latitude 30 degrees, 24 minutes north, longitude 87 degrees, 13 minutes west (11 miles from sea buoy). The port offers stevedoring and marine terminal services for any description of bulk, break-bulk, and unitized freight. Bagged agricultural products, forest products, asphalt, sulfur, lime, steel products, frozen and refrigerated foods, and project cargos are a few of the many commodities frequently handled through the Port of Pensacola.

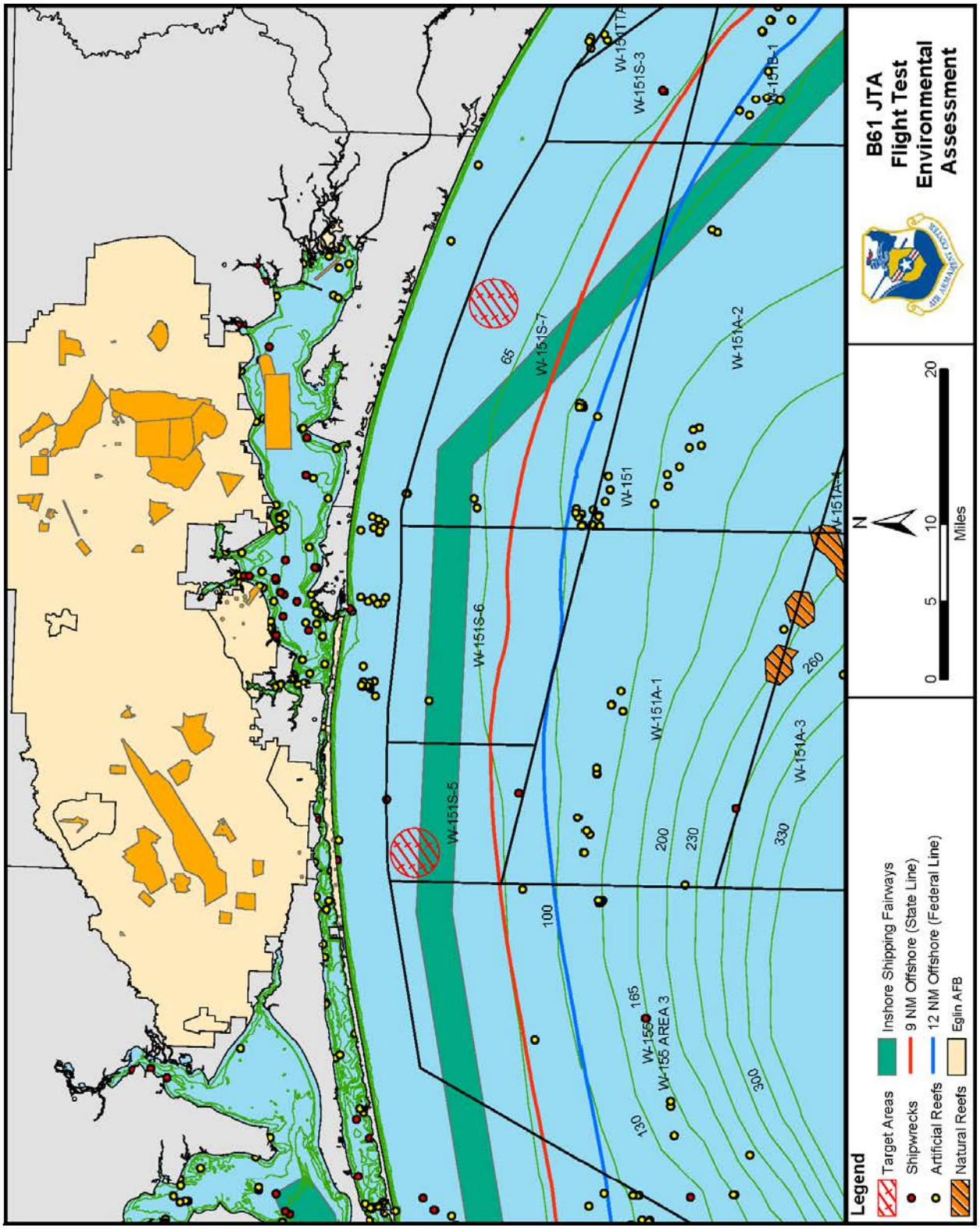

Figure 3-14. Major Shipping Fairways Near Proposed Action Areas in the Gulf of Mexico

Port Panama City USA was established in 1967. It contains five deep-water berths and intermodal transportation facilities. Foreign-Trade Zone #65 is also located at the Port and provides financial advantages to importers and exporters in the international market. Port Panama City is recognized as a Load Center for linerboard and wood pulp. Other commodities shipped through the port include feed products, steel, machinery, and dry and liquid chemicals. Port Panama City handled over 0.9 million short tons of cargo in FY96/97, and an estimated 1.1 million tons in FY01/02 (Florida Ports Council, 2001). The total dollar value of Florida's waterborne trade is presented in Figure 3-15.

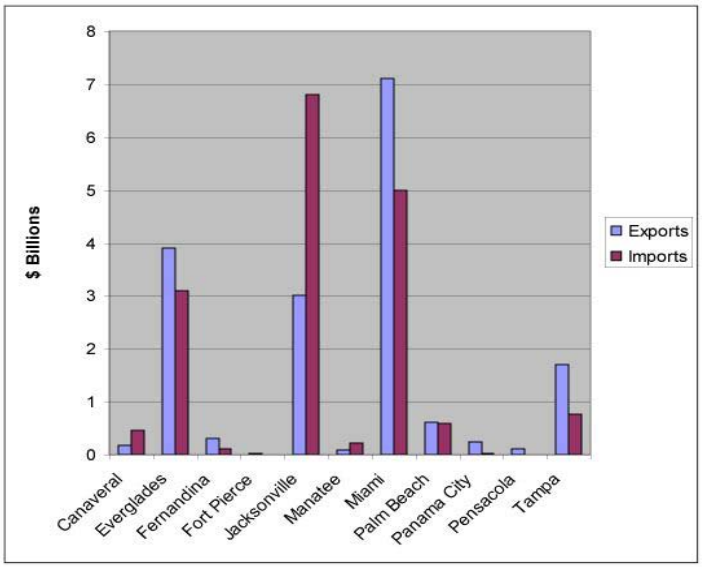

Figure 3-15. Dollar Value of Florida's Total Waterborne Trade
(Florida Ports Council, 2001)

The Florida Seaport Transportation and Economic Development Council's latest five-year plan estimates that by 2005, 466,000 jobs, or 6.6 percent of all private sector employment, will be attributable to seaport activities. In addition, by 2005, the seaports annual earnings are projected to increase by 68 percent to $11.1 billion; annual business sales are projected to increase by 61 percent to $36.8 billion, and annual state and local taxes will almost double, growing to $1.6 billion (FDOT, 2001).

3.3.7 Oil and Gas Production

The infrastructure for oil and gas production in the Gulf of Mexico is highly developed. This infrastructure includes oil refineries, petrochemical, and gas processing plants, supply bases for offshore services, platform construction yards, pipeline yards, and other industry-related installations. Oil and gas refineries, natural gas plants, and petrochemical plants contribute little to the eastern Gulf of Mexico economy. Florida oil production peaked in the 1975–1980 period with just fewer than 50 million barrels produced in 1978 (Florida Geological Survey, 1991). In 2000, oil production reached over 4.6 million barrels and over 605 million cubic feet of gas (Florida Geological Survey, 2001). There are no active oil and gas producing wells within the Eglin AFB overwater area.

3.4 BIOENVIRONMENTAL HAZARDS

According to the Resource Conservation and Recovery Act (RCRA), Section 6903(5), hazardous materials and waste are defined as substances that, because of "quantity, concentration, or physical, chemical, or infectious characteristics may cause or significantly contribute to increases in mortality or serious illnesses, or pose a substantial threat to human health or the environment." Hazardous materials as referenced here pertain to mission-related hazardous chemicals or substances meeting the requirements found in 40 CFR 261.21.24, are regulated under RCRA, and are guided by AFI 32-7042.

Chemical materials encompass a broad category of liquid, solid, and gaseous substances that are released into the environment as a result of mission activities. These include organic and inorganic materials that can produce a chemical change or toxicological effect to an environmental receptor. The chemical materials of interest for the B61 JTA testing are depleted uranium, thermal batteries, neutron generators, and other hazardous materials and explosives listed in the Proposed Action. Analysis examines the safety and contamination concerns for these materials.

All other explosives and hazardous materials contained in the B61 JTA are classified Secret Restrictive Data (SRD) and for security purposes cannot be identified or discussed in detail.

The JTA1, JTA3, and JTA6 configurations contain war reserve (WR) neutron generators and depleted uranium. The depleted uranium is mildly radioactive but not capable of causing a nuclear detonation. All JTA configurations also use sealed thermal batteries that contain lithium compounds and chromate/calcium compounds as well as explosive hazards. Most explosives in the JTAs are located inside the sealed center case section (the center case is a 0.52-inch-thick hard aluminum extrusion for the Mods 3/4/7/10) and are inaccessible during or after a normal test and would present no hazard. The explosives outside the center case section are accessible, however none of the JTA configurations planned to be tested at Eglin AFB ranges would contain Insensitive High Explosives (IHE).

Depleted Uranium

Depleted uranium (DU) is a waste product of the process that produces enriched uranium for use in atomic weapons and nuclear power plants. Much like natural uranium, it is both toxic and radioactive (IAC, 2003). Natural uranium consists primarily of a mixture of two isotopes (forms) of uranium, Uranium 235 (U235) and Uranium (U238), in the proportion of about 0.7 and 99.3 percent, respectively (FAS, 1999). Nuclear reactors require U235 to produce energy therefore, the natural uranium has to be enriched to obtain the isotope U235 by removing a large part of the U238. Uranium-238 then becomes DU, which is 0.7 times as radioactive as natural uranium. Since DU has a half-life of 4.5 billion years, there is very little decay of those DU materials (FAS, 1999).

Depleted uranium is not classified as a hazardous material; however, it is classified as a radioactive material and can be toxic by means of inhalation or ingestion. When fired, or after "cooking off" in fires or explosions, the exposed uranium rod poses an extremely low radiological threat as long as it remains outside the body. Taken into the body via metal fragments or dust-like particles, depleted uranium may pose a long-term health hazard to personnel if the amount is large. However, the amount remaining in the body depends on a number of factors, including the amount inhaled or ingested, the particle size and the ability of the particles to dissolve in body fluids.

Table 3-16. Accessible Hazardous Components in the B61 JTA Configurations

B61 MODS 3/4/10 NORMAL TEST RESULTS							
Weapon Components	**One Spin Rocket (MC3003 or MC4627)**	**One Gas Generator (MC3002 or MC3002A)**	**One Indicator (MC2906)**	**Two Parachute Reefing Cutters (MC3133)**	**Two MC3287 (Calcium/calcium chromate) Thermal Batteries; Non-ALT 335 only**	**Two MC2238A (calcium/calcium chromate) or Two MC2238B (lithium silicon/iron disulfide) Thermal Batteries**	**One MC2937 (Calcium/Calcium Chromate) Thermal Battery**
JTA 1/9A Used in FFA option only	Expended	Expended	Not Expended	May or May Not be Expended depending on test settings	May or May Not be Expended depending on test settings	Expended	Not Expended
JTA 3/6/9B Used in REG (JTA 6/9B) or REA (JTA 3/9B) only	Inert/dummy (Not MC 3003)	Expended	Not Expended	May or May Not be Expended depending on test settings	May or May Not be Expended depending on test settings	Expended	Not Expended
B61 MOD 7 NORMAL TEST RESULTS							
Weapon Components	**One Spin Rocket (MC1951, or MC3003, or MC4627)**	**One Gas Generator (MC1835 or MC3002A)**	**One Indicator (MC3544)**		**One MC3246 (calcium/calcium chromate) Thermal Batteries**	**Two MC2238A (calcium/calcium chromate) or Two MC2238B (lithium silicon/iron disulfide) Thermal Batteries**	
JTA 1A Used in FFA option only	Expended	Expended	Not Expended		Not Expended	Expended	
JTA 3/6 Used in REG (JTA6) or REA (JTA3) only	Inert/dummy (Not MC 3003)	Expended	Not Expended		Not Expended	Expended	

Table 3-16 summarizes the accessible hazardous components (those outside the sealed center case section) in the B61 JTA configurations that would be tested in the EGTTR and on TAs B-70 and C-52.

Thermal Batteries

There are two types of sealed thermal batteries within each JTA configuration, one type contains lithium compounds and the other type contains calcium/calcium chromate compounds. Calcium chromate is a yellow crystalline (sugar or sand-like) odorless material, which can be used in solution. It is used to inhibit corrosion, to depolarize batteries and to make pigments (NJDHSS, 1998). Calcium chromate is on the Hazardous Substance List because it is regulated by the Occupational Safety and Health Association (OSHA) and cited by American Conference of Government Industrial Hygienists, DOT (Department of Transportation), International Agency on Research for Cancer, National Toxicology Program, Human Health Assessment Group, National Institution for Occupational Safety and Health (NIOSH), Florida Department Environmental Protection (FDEP) and U.S. Environmental Protection Agency (USEPA). Calcium chromate is also on the Special Health Hazard Substance List because it is a carcinogen and mutagenic (substances that cause cancer and mutations in the body) (NJDHSS, 1998).

Lithium Compounds

Lithium compounds are inorganic compounds that contain lithium as an integral part of the molecule. Lithium is an alkali metal similar to magnesium and sodium in its properties (RAIS, 2003). Soluble lithium compounds are readily absorbed through the digestive tract but not the skin. Oral toxicity of most lithium compounds is relatively low. Case histories indicate that doses of 12–60 grams can result in coma, respiratory and cardiac complications, and death in humans (RAIS, 2003). However, limited information is available on the inhalation toxicity of lithium compounds as well as the carcinogenicity of lithium compounds.

Neutron Generators

The Neutron Generator in the B61 JTA is a device that creates neutron radiation. Specific chemical composition of the neutron generator is considered classified information and cannot be discussed for security purposes.

Installation Restoration Program Sites

No Installation Restoration Program sites have been identified on TA B-70.

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4. ENVIRONMENTAL CONSEQUENCES

4.1 NOISE

Thresholds and Criteria

Based on numerous sociological surveys and recommendations of federal interagency councils, the most common benchmarks for assessing environmental noise impacts are a Day-Night Average Sound Level (L_{dn}) of 65 dBA for A-weighted noise, and 62 dBC for C-weighted noise. Noise resulting from most transportation and other daily human-related activities is measured on the A-weighted scale. Impulsive noise, such as that resulting from gunfire or explosions, is measured on the C-weighted scale or as peak sound pressure level (dBP). These noise level thresholds are often used to determine residential land use compatibility and risk of human annoyance. Due to the infrequency of the action (twice a year), average noise levels, which are measured on an annual basis, would not be appreciably increased. Thus, average noise thresholds are not used to measure potential noise effects from the Proposed Action. Impulse noise thresholds and single event noise thresholds are more appropriate for this action.

Potential noise effects for the Proposed Action include annoyance and hearing effects. Annoyance may result from sleep disturbance or structural effects.

Annoyance

Public annoyance is often the most common impact associated with exposure to elevated noise levels. When subjected to Day-Night Average Sound Levels of 65 dBA, approximately 12 percent of persons so exposed would be "highly annoyed" by the noise. At levels below 55 dBA, the percentage of annoyance is correspondingly lower (less than 3 percent). The percentage of people annoyed by noise never drops to zero (some people are always annoyed), but at levels below 55 dBA, it is reduced enough to be essentially negligible. When subjected to Day-Night Average Sound Levels of 62 dBC, approximately 15 percent of persons so exposed would be "highly annoyed" by the noise (CHABA, 1981).

Maximum noise level (lmax) is the highest recorded sound on a sound meter from an event such as an aircraft flyover. The table (Table 4-1) of lmax noise levels below indicates the percent of people that may be annoyed at various levels of aircraft noise, based on one study (U.S. Army, 2001).

Table 4-1. Average A-Weighted Maximum Noise Thresholds from Aircraft

Maximum level, dBA	Percentage Highly Annoyed
70	5%
75	13%
80	20%
85	28%
90	35%

Source: U.S. Army, 2001

Structural Effects

Two large-scale tests have been conducted to study structural response to sonic boom overpressure. The most intensive test was conducted at White Sands, New Mexico, where 21 structures of various design and construction were instrumented and then exposed to more than 1,500 sonic booms. Except for glass, no damage was detected for overpressures up to 5 psf (141.56 dBP), nor were any damage effects evident after a series of 860 successive flights at about 5 psf. The only evidence of damage at the conclusion of the test other than glass breakage, was three bricks that had loosened beneath a window ledge (Slutsky, 1975). Generally, structural damage does not occur at psf less than 1; minimal damage occurs from 1 to 5 psf; and more severe damage can occur at overpressures greater than 5 psf (AFMC, 1997). The NASA fact sheet (NASA, 1997) on sonic booms states:

- At 1 psf, no damage to structures is expected.
- Rare minor damage may occur from 2 to 5 psf.
- Structures in good condition have been undamaged by overpressures of up to 11 psf.

A survey of existing models to predict sonic boom impacts on conventional structures has developed a new method of developing loss estimates for glass, plaster, and small ornamental objects made from such (Haber and Nakaki, 1989). This model predicts extremely minor damage to these materials from 0.5 to 2.0 psf; slightly increased damage from 2.0 to 4.0 psf; and potential cracking from 4.0 to 10.0 psf.

Hearing Effects

A Sound Pressure Level (SPL) of 140 dBP has been identified by the U.S. Department of Labor, OSHA, as a maximum recommended unprotected exposure level necessary to prevent physiological damage to the human ear drum (29 CFR Ch. XVII § 1926.52[e]).

An SPL less than 115 dBP has been shown to cause minimal public annoyance resulting from the noise (Table 4-2) (U.S. Army, 2001). Noise of 130–140 dBP would elicit a more vigorous complaint response along with the possibility of damage to structures or items within.

Table 4-2. Peak Sound Pressure Level Noise Thresholds Used by the U.S. Army

Sound Level, dB Peak	Risk of Complaints	Action
Less than 115	Low risk of noise complaints	Proceed with all programs.
115–130	Moderate risk of noise complaints	Proceed with important tests. Postpone noncritical testing, if feasible.
130–140	High risk of noise complaints, possibility of damage	Proceed with only extremely important tests.
Greater than 140	Threshold for permanent physiological damage to unprotected human ears; high risk of physiological and structural damage claims	Postpone all explosive operations.

Source: U.S. Army, 2001

The Proposed Action consists of two Action Alternatives and a No-Action Alternative. The following methodology was applied to address the effects of supersonic noise and subsonic noise from the action alternatives to people and wildlife, including sensitive species.

Flight scenarios obtained from the proponent would involve the aircraft F-16C, F-15E, B-52H, and B-2A flying up to four missions: two overwater and two overland. Supersonic flights would not occur over the water due to stipulations in AACI-201 that require that supersonic missions occur at least 25 nautical miles from shore. *The B-52H and B-2A do not fly at supersonic speeds*. A minimum altitude of 500 feet and a maximum altitude of 2,000 feet above surface level would be flown over the land targets at speeds of Mach 1.1 to Mach 1.2.

Supersonic Noise Analysis

When an aircraft travels faster than the speed of sound, a forward projecting pressure wave is produced from the nose of the aircraft that, depending on the aircraft's level and orientation of flight, may be audible on the ground as a boom (U.S. Air Force, 1996a). This wave is more or less propagated in the shape of a cone. Since the aircraft is traveling faster than the speed of sound this wave cone meets the ground behind the aircraft in a hyperbolic pattern as part of the wave cone intersects with the ground (Figure 4-1). Straight and level flight produces a boom wave that is symmetrical with equal overpressure contours, referred to as a carpet boom (U.S. Air Force, 1996b). For this analysis, straight and level flight is assumed.

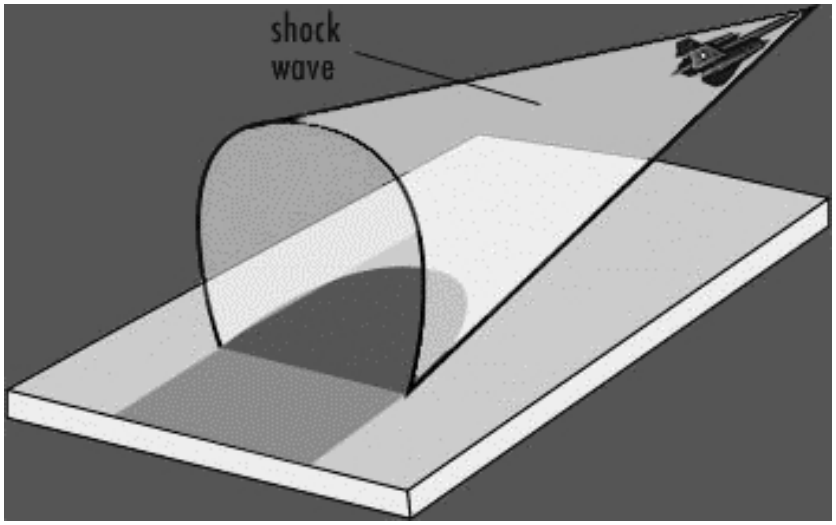

Figure 4-1. Sonic Boom Shock Wave
(Source: NOVA Online, 2000)

Supersonic boom noise is expressed using the peak sound pressure level metric or dBP. Atmospheric overpressures associated with sonic booms may potentially affect hearing, create annoyance, or do structural damage.

Supersonic noise modeling analysis in the Test Area B-70 PEA (U.S. Air Force, 1998) considered the following flight scenarios that are directly applicable to the Proposed Action.

- Two aircraft (F-15 and F-16)
- Two speeds (Mach 1.05 to Mach 1.2)
- Range of altitude (500 to 2,000 feet AGL)

The model, PCBoom3 (Armstrong Laboratory, 1995), was used to graphically produce a supersonic noise footprint of the resulting carpet boom which was overlaid onto GIS maps of Test Area B-70. By determining the size of the footprint for these variables, the minimum distance from the end of the supersonic corridor that would not project the boom carpet beyond the Eglin boundary was calculated. This distance is calculated in relation to point B, which is the start point of the supersonic flight corridor when the flight altitude is below 30,000 feet AGL, and point C, which is the end of the supersonic corridor (shown in Figures 4-2 and 4-3). According to AACI 11-201, Supersonic Operations (U.S. Air Force, 2003b), only the B to C portion of the corridor is permitted for low-level (below 30,000 feet AGL) supersonic flight.

4.1.1 Alternative 1

Under this alternative, testing of the B61 JTA involves one JTA drop every two years for each profile on both TA B-70 and in W-151. A maximum of four bomb drops would occur during each test year (Table 4-3).

Table 4-3. JTA WSEP Flight Test Proposed Action

Profile	B-70	EGTTR W-151 Shallow-Water Drop
Freefall Air (FFA) Parachute	1	1
Retarded Ground (REG) Parachute	1	1

There are four potential targets to be used for the B61 JTA WSEP flight tests: on land at TA B-70. The target at B-70 consists of a 90,000-ft^2 (300x300) concrete pad that would be constructed for testing.

The results of the PCBoom3 modeling effort from the Test Area B-70 PEA that are applicable to Alternative 1 are illustrated in Figures 4-2 and 4-3 and discussed in Table 4-4. The model identified a recommended pull-up distance after a supersonic run at B-70 that would prevent noise of 140 dBP from leaving the reservation. Since the aircraft and speed scenarios are very similar to the Proposed Action, those results apply to this analysis. Results are summarized as follows.

- The speed of the aircraft has minimal effect on the size or intensity of the boom carpet. This is best seen by comparing the distance from C (or distance past B) for the F-15E and F-16 when flying at a given altitude (Table 4-4). For example, the distance past B for the F-16 at 1,000 feet AGL only varies from 12.8 miles to 12.4 miles when slowing from Mach 1.2 to Mach 1.05. Based on available data, these pull-up points are similar to what has historically been used during supersonic missions.

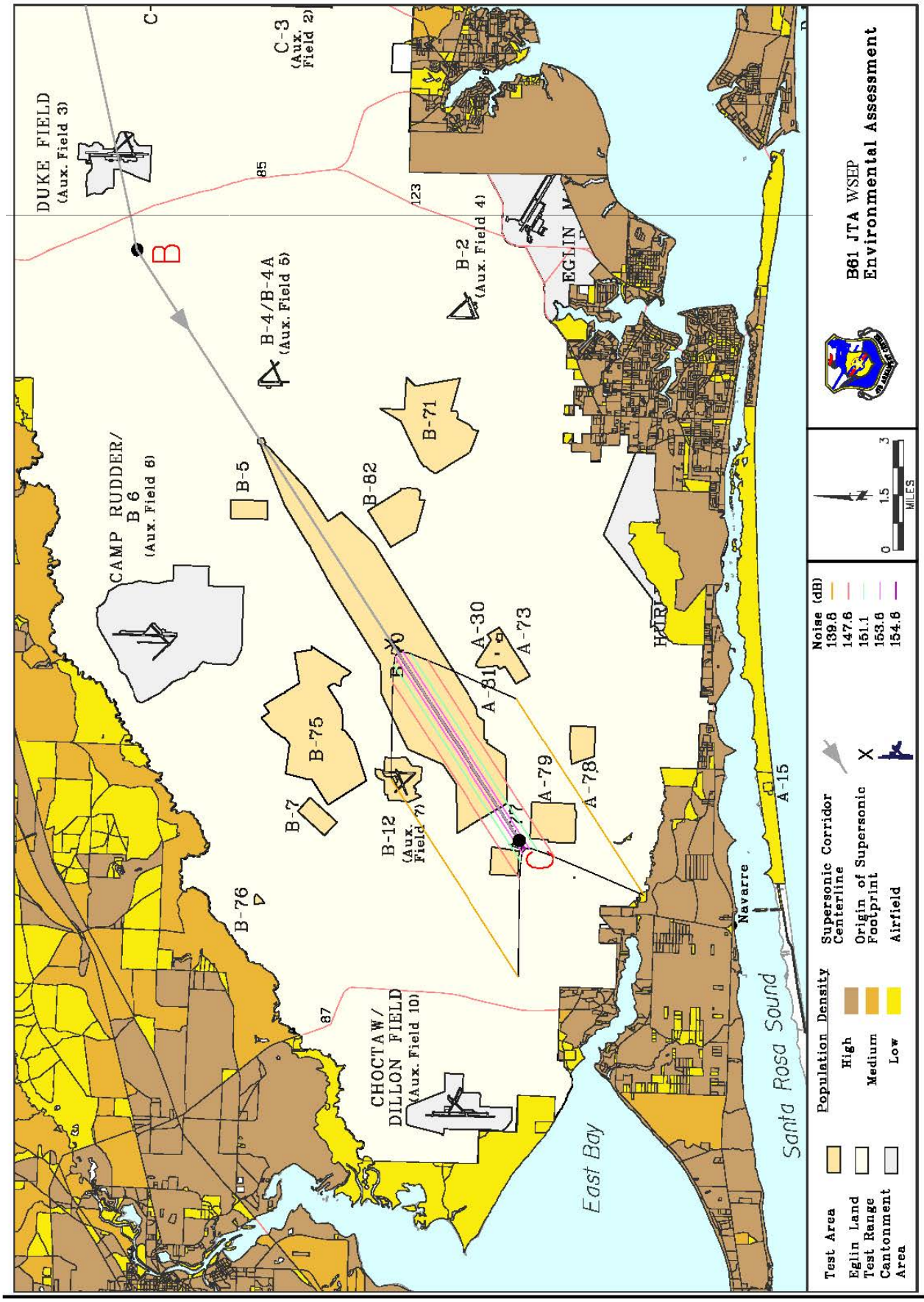

Figure 4-2. Supersonic Noise Footprint of F-16 at 1,000 Feet Altitude, Mach 1.2 and Relative Population Density

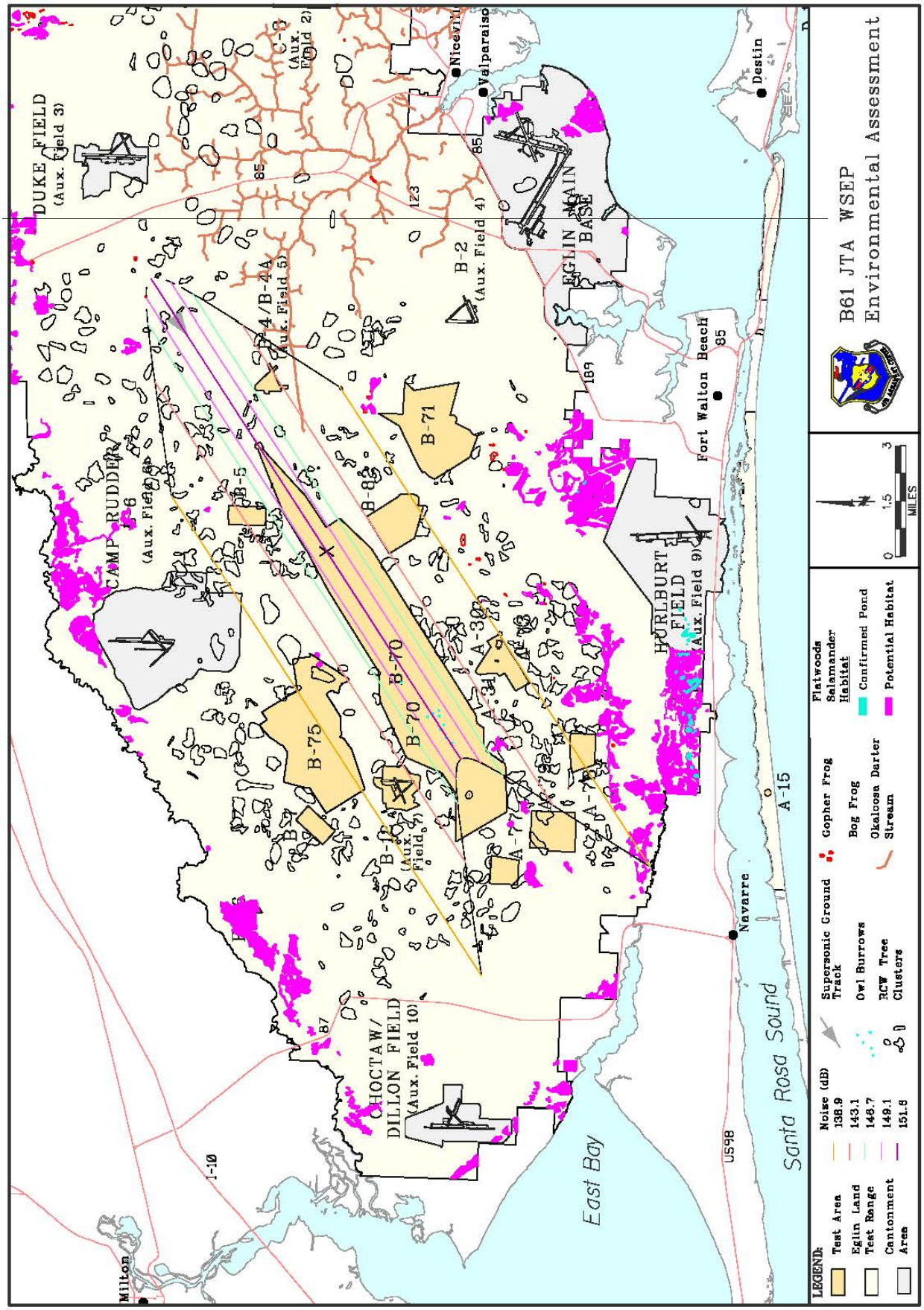

Figure 4-3. Supersonic Noise Footprint of F-15 at 2,000 Feet Altitude, Mach 1.2 and Sensitive Species

- The aircraft altitude is the variable that has the greatest effect on the size and intensity of the boom carpet. An increase in altitude creates a larger boom carpet footprint, but has a lower dB level. A decrease in altitude creates a more intense but smaller boom carpet footprint. Due to this difference, the F-15E would need to pull out of supersonic flight 9.6 miles before point C (compared to 6.3 miles before C at 1,000 feet AGL) to prevent the boom carpet (as shown in Table 4-4) from leaving the Eglin reservation. Targets 2, 3, and 4, being farthest away from the pull-up point (in Figure 4-2), may allow more flight flexibility and potentially fewer noise complaints. Target 1 provides less pull-up distance than Targets 2, 3, and 4. However, pilots may also use Target 1 if they pull up at the proper point before point C.
- Since the F-15E and F-16 do not differ drastically in mass or size, there are minimal differences in the size or intensity of their respective boom carpets.

Table 4-4. Supersonic "Pull-Up" Distances to Prevent Sonic Boom from Leaving Eglin Boundary*

Type of Aircraft	Maximum Speed (Mach)	Altitude (Feet AGL)	Distance Past B (Miles)	Distance from C (Miles)	dBP Level at Outer Edge of Boom
F-15	1.1	1,000	12.9	6.3	142.2
	1.1	1,500	11.9	7.3	140.8
	1.1	2,000	9.6	9.6	138.9
F-16	1.1	500	13.9	5.3	143.8
	1.1	750	13.3	5.9	141.7
	1.1	1,000	12.9	6.3	140.5
	1.2	500	13.7	5.5	142.2
	1.2	750	13.2	6.0	140.6
	1.2	1,000	12.8	6.4	139.8

*Based on Eglin standard weather conditions

Supersonic Noise Effects

Supersonic booms can potentially affect hearing in humans or wildlife, create annoyance, and or damage structures.

Hearing Effects

The maximum safe noise level for preventing damage to the hearing of human receptors is 140 dBP. This level has not been measured off range during any of the supersonic missions for which data have been collected. The Eglin Safety Office does not allow 140 dBP to leave the reservation, and the results of the PCBoom3 modeling effort show that if the aircraft terminates supersonic flight by the designated points shown in Table 4-4, 140 dBP would not be reached (theoretically) even under worst-case situations of speed and altitude. Also, the boom carpet has an outer edge dBP level of approximately 140 dBP for all of the scenarios modeled, yet the noise levels that are measured during supersonic missions are frequently in the range between 127 dBP and 138 dBP. Based on the model, any noise that reaches the sampling locations should be around 140 dBP. These results suggest that weather patterns are extending the boom footprint but also attenuating the intensity. Headwinds or winds blowing out of the southwest, would serve to direct more of the boom energy on to the ground while tailwinds out of the northeast would propagate boom noise further ahead of the aircraft.

Though the boom carpet would not leave the range, noise at the center of the boom carpet would be at a level sufficient to cause some degree of at least temporary hearing impairment to personnel within the boundaries of the Eglin reservation. A risk of hearing impairment is present with peak noise levels of 151 dBP and the Proposed Action would produce sonic boom noise with highest intensities up to 154.6 dBP according to PCBoom3 modeling. The aircraft flight track, and thus the highest level of noise, would be along centerline road of Test Area B-70. Personnel on the Eglin reservation that would potentially be exposed to noise greater than 140 dBP would need ear protection. Areas southwest of TA B-70 normally accessible to the public would need to be cleared of non-mission personnel. These measures would prevent adverse effects to the public or mission personnel on the reservation.

Annoyance

Annoyance may be experienced from supersonic noise when overpressures and noise from sonic booms startle or wake those sleeping, or achieve energy levels sufficient such that vibrations are felt in windows and structures. Overpressures capable of breaking windows can be produced by supersonic overflights, but for the Proposed Action are primarily a concern for any buildings on the reservation beneath the flight track.

Sleep Disturbance

Sound attenuates approximately 6 dB for every doubling of distance. Given that the proper pull-up distances are adhered to, some noise less than 140 dBP but sufficient enough to cause annoyance may result from this alternative. The tests would be conducted during the day and could potentially startle or awaken people such as those who work nights and sleep days, small children and infants, or the sick and elderly. A sound level of 115 dBP is estimated by the U.S. Army to have a low risk of noise complaints. Under a favorable weather scenario of no winds from the northeast, the Proposed Action would potentially generate noise of at least 130 dBP approximately 3 miles beyond the reservation boundary into the Navarre and Holley areas, given that the aircraft pulled up by the point designated as C on Figure 4-2. Thus, the Proposed Action could potentially produce noise off the reservation considered by the U.S. Army (Table 4-4 above) to carry a high risk of noise complaints.

Structural Effects

At 130 dBP, there is a high risk of noise complaints. Structural vibration (but no damage) is also possible at this level. The threshold for structural damage would begin with window breakage, which would occur at approximately 150 dBP (U.S. Army, 1995). Noise of 140 dBP should not leave the reservation if winds are calm or blowing from the southwest; such conditions are favorable for limiting the propagation of noise. Conversely, unfavorable weather conditions, such as strong northeast winds could potentially result in adverse noise impacts off the reservation. Thus, these potential effects should be evaluated real-time with consideration being given to existing weather conditions prior to conducting this mission. Regardless, if pull-up distances were observed no window breakage or structural damage would occur off the reservation.

Effects on Wildlife

Figure 4-3 shows the supersonic noise footprint of an F-15 at 2,000 feet altitude, traveling at Mach 1.1. This footprint would cover a greater area than the F-16 at 1,000 feet but the more intense noise remains confined to Test Area B-70. Both scenarios would potentially expose protected species to noise greater than 140 dBP. However, the exposure to sensitive wildlife populations from this level of noise would be occasional and brief such that effects to the overall population of a sensitive species would not be significant. Burrowing owls have been present along the centerline road area of Test Area B-70 for several years in spite of the noise from supersonic overflights. Historically, red-cockaded woodpeckers (RCWs) have continued to nest near TA B-70 despite occasional exposures of cavity trees to supersonic noise of 154 dBP. While the noise could arguably result in some adverse response or effect to an individual animal, including possible hearing effects and startle or flight, it is not expected to result in decreased use of the habitat by RCWs. The population on this side of the Eglin reservation is stable and increasing. Other species that occur within the 140-dBP noise contours include flatwoods salamanders (potential habitat) and Okaloosa darters, both of which live in habitats (i.e. water or subsoil) that would dampen or reflect airborne noise. Thus, noise effects to these species are not anticipated to be harmful. The infrequency of the test and the brief exposure time would not result in significant effects to any sensitive species.

4.1.2 Alternative 2

Alternative 2 involves high altitude delivery (>20,000 feet) from aircraft flying at subsonic speeds. While aircraft noise is perceptible at this altitude, it is not beyond the scope of normal daily aircraft operations at Eglin AFB.

4.1.3 No-Action Alternative

Under this alternative, B61 JTA WSEP flight-testing would not occur. Thus, there would be no noise impacts.

4.2 SOCIOECONOMIC RESOURCES

There would be no economic impacts. The socioeconomic resources that can be impacted by noise over TA B-70 are human receptors and property in the nearby communities. However, no significant loss or contribution to income is anticipated from twice yearly supersonic overflights from the Proposed Action.

4.2.1 Alternative 1

Economic Impacts

There would be no economic effects in the EGTTR. The area closed would only be about 5 square miles or stated differently, a circle with a radius of 1.5 miles. The area would be closed for 12 to 24 hours, probably during a weekday. Known wrecks and artificial reefs are not located within either of the alternative sites. Prior notification through NOTMARS would allow charter boats to avoid the closed area without economic hardship. Scheduling would strive to avoid major tournaments.

Subsonic Noise Analysis

Sound Exposure Level (SEL) refers to a cumulative exposure to sound equivalent in energy to one second of sound at the stated level. A SEL of 95 dB was proposed in the Eglin Noise Study as a level at which some further analysis of the action might be warranted. An A-weighted SEL (ASEL) of 95 dB would awaken approximately 58 percent of people exposed (U.S. Air Force, 1996a). Exceeding this level of noise does not denote significance, or incompatible land use, and therefore does not warrant an environmental impact statement. Furthermore, this level is designed to be used as guidance in areas around the Eglin reservation that are located away from any of the airfields.

The areas immediately off the reservation in line with the TA B-70 flight track have a background noise level of approximately 49 dBA based on 1992 and 1995 census data (U.S. Air Force, 1996a). The Federal Interagency Commission on Noise recommends further study for ASELs for a given action that result in a 3 dB incremental increase over background noise levels. According to the Eglin Noise Study, a single aircraft flyover over this area would increase noise 2.9 dB, an indication that low-level subsonic flights from the Proposed Action would potentially result in some noise effects off of the reservation.

An overflight of the B-52H at an altitude of 2500 feet was specifically mentioned as one scenario that would exceed the 95-ASEL threshold. Thus, after the B61 JTA is delivered onto TA B-70, some measures or change in flight should be evaluated to enable the B-52H to attain a greater altitude than 2500 feet before continuing flight over non-reservation lands.

Table 4-5. Sound Exposure Levels (SEL) in dB from Distance to Ground

Aircraft Type	Airspeed (mph)	Distance to Ground (feet)			
		500	1,000	2,000	20,000
F-15	520	112	107	101	65
F-16	450	107	101	95	59
B-52H	287	108	102	94	58.7
B-52H	173	115	108	100	63
B-52H	196	118	112	105	77.2

Source: U.S. Air Force, 1996a. mph = miles per hour

4.2.2 Alternative 2

Alternative 2 includes the activities outlined in Alternative 1 with the inclusion of a 20,000-ft, high altitude drop of the B61 JTA at TA C-52C. This drop would be a freefall air scenario. The noise produced from the B-2 and/or B-52 aircraft at these altitudes would not be significant. At 20,000 feet, the air to ground sound exposure level (SEL) from a B-52 would range from 58.7 to 77.2 dB (U.S. Air Force, 1996). Information on the B-2A was not available but this aircraft would be quieter than the B-52H.

4.2.3 No-Action Alternative

Under this alternative, the Proposed Action would not take place and no impacts would occur.

4.3 SOILS

4.3.1 Alternative 1

The main components of an erosion analysis are the soil type, the vegetative cover, and the topography of the test site as well as the type of activity occurring in the area. Impacts to soil from landing of the B61 JTA inert ordnance would be minimal and localized. Analysis, therefore, focuses on the elements associated with the construction and demolition of the concrete pad for B61 JTA release on Eglin AFB. While difficult to quantify, the potential for erosion to occur can be evaluated qualitatively, and minimization procedures can be identified that would reduce the potential for adverse impacts from erosion.

The clearing of land for construction and demolition of the concrete pad and any roadways needed would disturb over 2 acres of soils and subsequently provide opportunities for erosion. Almost all soils at the four proposed target sites on B-70 are loose and sandy and prone to erosion. Transport of materials off of the construction site would potentially occur and some increase in introduction of sediments into watersheds or surface waters could result. However, each target site has a large buffer zone radiating from the proposed area for the concrete pad. No streams or surface waters are located in this buffer zone, which decreases the likelihood for erosion and sedimentation. To further minimize the amount of soil leaving the construction site, best management practices (BMPs) typically used for construction projects on Eglin, would be employed. These practices would effectively reduce the risk for increased sedimentation in the adjacent stream.

During construction, mitigations such as silt screens and hay bales would be placed around the perimeter of the construction site to alleviate the potential for runoff to flow from the site and enter sensitive habitats. Such barriers would be strategically placed to protect the potential flatwood salamander and gopher frog habitats from runoff at Target 1 and/or protect the bog frog habitat from sedimentation at Target 3. Additionally, paved surface areas should be constructed with a grade, or slope, to direct potential runoff away from the sensitive areas. Given the small size of the project and the use of BMPs, impacts to soil and subsequent effects would not be significant.

4.3.2 Alternative 2

B61 JTA testing would occur on C-52C without construction of a concrete pad. Effects to soil from landing and retrieval of the inert ordnance would be localized and minimal. Therefore, minimal to no impacts to soils are expected.

4.3.3 No-Action Alternative

The test would not be conducted. Therefore, no impacts would occur.

4.4 WATER QUALITY

4.4.1 Alternative 1

The only natural surface waters on TA B-70 are Live Oak Creek, which runs through the middle of the range in a north/south direction, and Bull Pond, which is located near the southwest corner of the range (Figure 3-6 in Chapter 3). These areas are outside of the target area footprints; thus,

there should be no impacts to water quality. Although the B61 JTA spin rocket and motor would produce explosive by-products that may enter Gulf waters, these amounts are minimal and would not produce adverse environmental impacts. The B61 JTA would be immediately retrieved upon entry into the Gulf, and the depleted uranium (DU) and neutron generator should remain intact. No impacts from the neutron generator or DU would ensue.

4.4.2 Alternative 2

No streams are located within B61 JTA Target Areas on C-52C, thus no impacts to water quality would result.

4.4.3 No-Action Alternative

The test would not be conducted. Therefore, no impacts would occur.

4.5 BIOLOGICAL RESOURCES

4.5.1 Alternative 1

Potential Noise Impacts to Wildlife

Overland Supersonic Flight Noise

The effects of aircraft noise on wildlife have been shown in a laboratory setting to lower reproduction in a variety of animals, mostly domestic (Manci et al., 1988; Anderson et al., 1986; Berglund et al., 1990). Other studies suggest that several animal species show resilience to loud noises. For example, low-flying (<500 feet AGL) F-16 training flights in Florida were found to have no demonstrated effect on the establishment, size, and reproductive success of wading bird colonies distributed state-wide. Nest success, nestling survival, and nesting chronology depended more heavily on location and climatology than on the effects of the F-16 overflights (Black et al., 1984; Gladwin et al., 1988). The same study cites the apparent ability of some wading birds to habituate or become accustomed to frequent, low-altitude, light aircraft overflights.

The boom carpets generated by supersonic flight overlap with the habitats of both burrowing owls and red-cockaded woodpeckers as shown previously in Figure 4-3. Because the burrowing owls are located on the test area (B-70), they have been exposed to the boom carpet during past supersonic missions. The burrowing owls continue to nest successfully on Test Area B-70 despite the noise from sonic booms, as well as other disturbances, such as detonations. The availability of proper habitat afforded by the maintenance of the grass grid apparently overrides any potential harm created by the noise of sonic booms. No significant impacts to burrowing owls are anticipated from the sonic boom.

The red-cockaded woodpecker (RCW) is also nesting successfully in close proximity to TA B-70. There is other suitable habitat available, but the RCWs have remained near the test area. Like the burrowing owl, suitable habitat appears to outweigh any negative influences associated with supersonic booms. Studies at a Navy bombing range in Mississippi have indicated that RCWs can acclimate to excessive noise levels (Jackson, 1980). Observations have indicated that many animals become adapted to human activities and noises (Busnel, 1978).

Scientists who have researched the effects of noise on wildlife report that animals will react with a startle effect from noises, but adapt over time, so that even this behavior is eradicated (Busnel, 1978). Based on the fact that the RCW population continues to grow at Eglin, including the population in close proximity to TA B-70, it appears that RCWs have become acclimated to noises associated with the military mission including supersonic booms. No significant impacts to red-cockaded woodpeckers are anticipated from the sonic boom.

Concrete Pad Construction/Demolition Noise

The noise from construction and demolition of the concrete pad on B-70 has the potential to impact sensitive species. However, many sensitive species including RCWs, gopher tortoises, and burrowing owls continue to nest and reproduce successfully on and around B-70, where they are routinely exposed to loud noises. Noise levels from the construction and demolition of the concrete pad would be much less than those associated with detonations and other activities on B-70, such as the sonic booms described above. Additionally, construction and demolition noise would be short-term. No significant effects to sensitive species are expected from noise associated with the construction and demolition of the concrete pad on B-70.

Direct Physical Impacts

The potential for wildlife to be directly impacted by deployment and retrieval activities of the B61 JTA is unlikely.

Concrete Pad Construction/Demolition

Target areas were selected to avoid known burrowing owl and gopher tortoise burrows, so direct impacts to these species are not expected from construction and demolition of the concrete pad. However, surveys for gopher tortoises and burrowing owls should be conducted prior to construction to ensure that no new burrows have been established.

Overland Tests

The potential exists for the parachute on the B61 JTA to impact sensitive species on Test Area B-70. Natural Resources personnel have reported at least one instance of a deer ingesting an illumination flare parachute; the deer was attracted to the smoke by-products (i.e., salts) coating the chute and the chute became stuck in the animal's throat. However, the likelihood of entanglement in or ingestion of the parachute on the B61 JTA is low because the device would be quickly retrieved upon landing.

No direct physical impacts to sensitive species from the B61 JTA are expected at Test Area B-70 because the bomb would land on a concrete pad.

Overwater Tests

Inert Bomb Impacts

Cetaceans, such as dolphins, are common to the eastern Gulf of Mexico and are protected under the Marine Mammal Protection Act. The only marine mammal species likely to be encountered within the study areas are the bottlenose dolphin and the Atlantic spotted dolphin, therefore

analyses focus on these two species. In order to calculate the maximum potential number of dolphins directly impacted by the B61 JTA, the density of dolphins (23.69 dolphins per 100 km^2) was multiplied by the size of the device (0.0000019 km^2), yielding 0.000045 dolphins potentially directly impacted.

Multiple sea turtle species may also be found in the proposed target areas. In order to calculate the maximum potential number of sea turtles in a given target area, the density of sea turtles (4.708 sea turtles per 100 km^2) was multiplied by the size of the target area (0.0000019 km^2), resulting in 0.00000895 sea turtles potentially directly impacted.

Due to the remote probability of a direct strike to protected marine species by the inert JTA B61, no formal procedures to locate and clear sea turtles and marine mammals from the area will be necessary. If ships or aircraft are involved in the mission and available to aid in observation, the area will be checked for the presence of protected species. Although no formal management requirements for surveys of protected species will be established, testing should, however, be conducted from December to March, when possible, to avoid sea turtle nesting and hatching season. No significant impacts to dolphins or sea turtles are anticipated.

Parachute Impacts

Under the Proposed Action, inert bombs with parachutes are expected to enter the Gulf and settle on the floor. It is possible that a sea turtle or marine mammal could become entangled in the parachute deployed with the B61 JTA. However, the testers would quickly retrieve the device from the water, making it unlikely that any marine animals would become entangled.

Ingestion of the parachute by marine animals is also possible. Sea turtles often ingest items that look like their prey (*Sargassum* and jellyfish) such as plastic bags, beads, and sheeting (U.S. Air Force, 2002a). In a study by Laist (1997), 86 percent of all sea turtle species are known to ingest items discarded in the ocean. However, of 388 sea turtle necropsies performed on animals found on Florida beaches, only 1 percent had consumed debris (U.S. Air Force, 2002a). Due to the low likelihood that the debris would be ingested and the fact that the parachute would be retrieved quickly, the likelihood that the parachute would be ingested by a marine animal is low.

Habitat Alteration

A habitat in this instance refers to the ecological and geomorphological components such as vegetation, soil/sediment, topography/bathymetry, and water that support organisms. Habitats may be altered by a variety of factors, including changes in vegetation, structure, food sources, breeding and nesting areas, etc. Habitat alteration may lead to decreased survival of sensitive species or degradation of areas critical to overall species diversity. Habitat alteration can result from activities like construction projects and munitions impacts.

This section analyzes the potential for mission activities to impact the physical condition of habitats associated with Test Areas B-70 and W-151. While difficult to quantify, the potential for habitat alteration to occur can be evaluated qualitatively and minimization procedures can be identified that would reduce the potential for adverse impacts. To analyze habitat alteration, authors consulted available literature and maps on wetlands, floodplains, Essential Fish Habitat,

sensitive species' habitat, and other habitats within the region of influence, and communicated directly with parties knowledgeable about resources and potential impacts.

Construction/Demolition of Concrete Pad

The strategic placement of the concrete pad will play a key role in avoidance of adverse impacts to sensitive habitats on B-70. All of the target areas are open grasslands and shrublands. Therefore little clearing of vegetation is expected; only a few scrub oaks may be destroyed.

All locations of burrowing owls, gopher tortoises, RCWs, and bog frogs, as well as potential habitat for flatwood salamanders and the gopher frog, fall outside of the potential target areas. Immediately prior to construction, surveys for gopher tortoises and burrowing owls should be conducted to ensure that no new burrows have been excavated. No direct adverse impacts to the habitats of sensitive species are expected.

Runoff from the construction site has the potential to affect surface water quality, floodplains, and wetlands, as well as sensitive species' habitat. Bull Pond, which is documented gopher frog habitat and potential flatwood salamander habitat, is located to the north of Target 1. Live Oak Creek, which supports a known bog frog population, is located between Targets 3 and 4. An August 2000 biological assessment at Eglin Road 235 (where Live Oak Creek flows out of TA B-70) indicated that the stream was impaired by excess sediment from clay mining, dirt roads, forestry, and bombing on range B-70 (FDEP, 2000); therefore it is important to prevent further degradation of this stream.

The concrete pad would be constructed in the middle of the proposed target area, which leaves a large buffer zone around the concrete pad. It would be approximately 0.5 miles from the edge of the concrete pad to the outside of the buffer zone. No streams, wetlands, floodplains, or sensitive species habitats fall within 0.5 miles of the proposed concrete pad locations at Targets 1, 2, or 3. Given the distance between the proposed construction site and sensitive habitats, runoff is not expected to impact water quality or sensitive species habitats near these sites as long as appropriate Best Management Practices (BMPs) are employed. BMPs should include the use of silt screens and weed and fire ant free hay bales during construction and demolition. Additionally, paved surface areas should be constructed with a grade, or slope, to direct runoff away from any of these sensitive areas.

Target area 4 does not include any streams, wetlands, or sensitive species habitats, but it does cover a portion of the 100-year floodplain. Federal agencies, where possible, must avoid the modification of a floodplain as stated under EO 11988, Floodplain Management (Federal Register, 1977a). Therefore, either the concrete pad should be placed outside of the floodplain at Target 4, or, if construction in the floodplain is required, a Finding of No Practicable Alternative would be necessary. Any construction activities at this site would require the same BMPs as detailed above.

Overland Tests

Habitat impacts from the landing of the B61 JTA on Test Area B-70 are not anticipated because it would land on a designated concrete pad. However, retrieval of the B61 JTA could create potential for soil disturbance and vegetation damage. Vehicles used to enter the testing area have

the potential to collapse gopher tortoise burrows, which would not only impact the tortoise but the many other sensitive species that use these burrows for shelter including the gopher frog, eastern indigo snake, and Florida pine snake. To reduce the potential for these negative impacts to occur, it is recommended that vehicles use existing roads when possible and that individuals thoroughly survey for burrows before establishing new roadways. If these practices are followed, then no significant impacts to sensitive habitats are anticipated from the landing or retrieval of the B61 JTA.

Overwater Tests

The Magnuson-Stevens Fishery Conservation & Management Act requires federal agencies to assess potential impacts to Essential Fish Habitat (EFH). EFH is described as those waters and substrate necessary for fish spawning, feeding, or growth to maturity. Examples of areas that provide EFH to fishes include seagrasses, artificial and natural reefs, and shipwrecks. There are no known breeding grounds or critical habitat for cetaceans within the waters of the Gulf of Mexico. Seagrass beds do not exist in this portion of the Gulf, and no hardbottom areas or shipwrecks are located in the target areas. Considering the above, no adverse effects to EFH are anticipated.

As stated above, no hardbottom areas are located within the boundaries of the target areas, so when the bomb sinks to the ocean floor, it would only encounter soft mud. The landing would likely cause a small sediment cloud, but this would be expected to settle quickly. On-site recovery teams would recover the bomb and parachute following the test event. Analogous to the object settling on the seafloor, localized effects may be produced from retrieval. The team that would recover the device from the seafloor would likely disturb the sediment. However, the effects of retrieval would be limited to a small area and would rapidly dissipate. Therefore, no significant impacts to habitat or water quality are expected from the landing or recovery of the bomb.

4.5.2 Alternative 2

Noise

Noise impacts to biological resources at Test Area B-70 and in the Gulf are the same under Alternative 2 as those discussed under Alternative 1.

Direct Physical Impacts

The target areas on Test Area C-52C were selected to avoid known and potential locations of sensitive species, such as the gopher tortoise. The small number of tests conducted coupled with the low probability of occurrence for sensitive species in the target area create low potential for direct hits. Wildlife would most likely avoid target areas during testing due to the presence of aircraft, but to ensure that no sensitive species were impacted, a visual survey of the target area should be conducted prior to testing to clear sensitive species. Direct physical impacts to sensitive species on Test Area C-52C are not anticipated.

Habitat Alteration

On C-52C, there is potential for habitat alteration because the device would land directly on the ground surface. However, given that the majority of the target area is shrubland/grassland and

that the B61 JTA would deploy a parachute before landing, impacts to the ground surface are expected to be minimal.

Proposed target area 1 has a few small wetlands scattered across it, but they only cover a small portion of the area. Along its western edge, Target 2 overlaps a small area of floodplain. Target area 3 overlaps a small portion of floodplain and wetland along its southern edge. It is unlikely that the device would land in the floodplain or wetland areas given their small size in comparison to the size of the entire target area, but if it did, impact would be minimal because the device would be attached to the parachute and would be retrieved quickly. Additionally, it is likely that given the small size of these wetlands, that they are only seasonally wet, so if testing were conducted during the summer or fall, these wetlands may not contain water.

4.5.3 No-Action Alternative

B61 JTA testing would not occur under this alternative; therefore, there would be no impacts to biological resources.

4.6 SAFETY AND OCCUPATIONAL HEALTH

4.6.1 Alternative 1

Through coordination with the 46 OG/OGP, Eglin's Range Safety Office will define footprints around target areas with an adequate margin of safety to protect the public health. As flight profiles have yet to be finalized, it is impossible to determine the precise location and dimension of the safety footprints. However, the Eglin Range Safety Office has confirmed that at a minimum, safety footprints will be at least 0.25 nautical miles in radius extending from each drop location in the Gulf of Mexico. At B-70, the 90,000-ft^2 concrete pad would provide the base for the safety footprint. Hearing protection would be required of all on-site personnel at B-70 (refer to Section 4.1, Noise).

The drop locations in the Gulf of Mexico would be cleared of all personnel and any surface craft prior to each mission (Figure 4-1). If vessels are employed during B61 JTA testing, then surface craft will be utilized, as available, to maintain the buffer and ensure that there is no breach of the safety buffer by public or private craft. All commercial and recreation watercraft would be restricted from the target impact area in order to be protected from health issues related to direct physical impacts from the inert JTA. The standards of 140 dBP (0.029 psi) and 115 dBP (0.002 psi) are used for human hearing protection requirements and annoyance to the public, respectively. Noise overpressure levels of 140 dBP (0.029 psi) would not extend beyond the safety footprint.

4.6.2 Alternative 2

Under Alternative 2, the inclusion of a 20,000-ft, high altitude drop of the B61 JTA at TA C-52C would not increase any anticipated impacts to safety. Range safety protocols for closing areas during release would be followed on all land ranges. Anticipated impacts are the same as those under the Proposed Action.

4.6.3 No-Action Alternative

Under the No-Action Alternative the B61 JTA Test would not occur and there would be no impacts to safety and occupational health.

4.7 BIOENVIRONMENTAL HAZARDS

4.7.1 Alternative 1

It is not anticipated that usage of chemical materials associated with the B61 JTA during the Proposed Action would adversely impact human health when standard operating procedures for use are followed. As a result of the spin rocket and/or gas generator being fired, all post-test JTAs will be contaminated with explosive by-products (smearable lead as an example). This contamination will be centered around the spin rocket portions of the preflight section and the parachute deployment tube at the rear of the tail case section. Therefore, any personnel handling the post-test JTA must wear protective gear until the contaminated areas are either cleaned up or covered by tape/and or plastic to prevent contact with contaminants.

After the required 60-minute wait, a qualified Explosives Ordnances Disposal (EOD) Response team would be required to inspect the post-test JTA and, if necessary, perform and render safe procedures prior to any other personnel approaching the post-test JTA.

Like the DU, calcium chromate can only represent a health hazard if it is directly inhaled or absorbed through the skin. Breathing calcium chromate can irritate the nose, throat, and lungs, and can also cause a sore or hole in the "bone" dividing the inner nose (septum), sometimes with bleeding, discharge, and/or formation of a crust (NJDHSS, 1998).

The DU would not be expended, and therefore, would not affect the environment within and adjacent to B-70 and W-151. However, as a precautionary measure, a Radiological Materials Response Team must be present during every test. In the event of a DU release, all personnel must be equipped with respiratory protection and protective gloves. The procedures for clean up of the DU will be in accordance with Air Force Radioactive Materials Disposal Procedures.

As defined by OSHA, the legal airborne permissible exposure limit (PEL) for calcium chromate is 0.1 mg/m^3 (as chromic acid), and not to be exceeded at any time. The levels occurring in the thermal batteries exceed this limit; therefore, a Hazardous Materials Response Team is required to be present at every test. Each member of the team must wear protective clothing/gloves before handling any contamination sites. Impact resistant eye protection must also be worn at all times.

4.7.2 Alternative 2

Alternative 2 includes the actions outlined in Alternative 1 with the inclusion of a 20,000 foot, high altitude drop of the B61 JTA at TA C-52-C. These drops would be retarded air and freefall air scenarios. Potential health risks are the same as Alternative 1, however because of the higher altitude drop, a greater potential exists for the center case section to open, exposing radioactive and hazardous materials. All procedures for the handling of radioactive and hazardous materials must be consistent with that of Alternative 1.

4.7.3 No-Action Alternative

The tests would not be conducted and therefore, no impacts to the environment would occur.

4.8 CUMULATIVE EFFECTS AND IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

4.8.1 Cumulative Effects

According to Council on Environmental Quality (CEQ) regulations, cumulative effects analysis in an environmental assessment should consider the potential environmental impacts resulting from "the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions" (40 CFR 1508.7).

Definition of Cumulative Effects

Cumulative effects may occur when there is a relationship between a Proposed Action and other actions expected to occur in a similar location or during a similar time period. This relationship may or may not be obvious. Actions overlapping with or in close proximity to the Proposed Action can reasonably be expected to have more potential for cumulative effects on "shared resources" than actions that may be geographically separated. Similarly, actions that coincide temporally will tend to offer a higher potential for cumulative effects.

In this Environmental Assessment (EA), an effort has been made to identify all actions on or near the action area that are being considered and are in the planning stage at this time. To the extent details regarding such actions exist and the actions have a potential to interact with the Proposed Action outlined in this EA, these actions are included in the cumulative analysis.

Past, Present, and Reasonably Foreseeable Actions

This EA applies a stepped approach to provide decision-makers with not only the cumulative effects of the Proposed and Alternative Actions, but also the incremental contribution of past, present, and reasonably foreseeable actions.

Past and Present Actions Relevant to the Proposed Action and Alternative

The *Test Area B-70 Final Programmatic Environmental Assessment* (U.S. Air Force, 1998), *Test Area C-52 Complex Final Programmatic Environmental Assessment* (U.S. Air Force, 1999), *Overland Air Operation, Final Programmatic Environmental Assessment* (U.S. Air Force, 1998a), and the *Eglin Gulf Test and Training Range, Eglin Air Force Base, Florida Final Programmatic Environmental Assessment* (U.S. Air Force, 2003a) evaluated many activities associated with testing and training activities. Inert and live detonations in the Gulf of Mexico, debris, chemical materials, restricted access, safety, and socioeconomics were evaluated and determined to have no significant impact on the environment. No other actions, either past or present, in or near the B61 JTA were found to be relevant to the Proposed Action or Alternatives (e.g., large developments or construction projects).

Reasonably Foreseeable Future Actions

Interviews have identified no reasonably foreseeable future large development relevant to the Proposed Action or Alternatives over the next five years.

Analysis of Cumulative Impacts

There are no known present or reasonably foreseeable future actions relevant to the Proposed or Alternative Actions. Due to the short duration of each test event, the temporary nature of potential impacts, and the insignificance of the longer-term impacts (e.g. debris increase), cumulative impacts to the human environmental are not anticipated. No cumulative impacts have been identified.

4.8.2 Irreversible and Irretrievable Commitment of Resources

NEPA requires that environmental analysis includes identification of any irreversible and irretrievable commitments of resources that will be involved in the Proposed Action should it be implemented. Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects that the uses of these resources have on future generations. Irreversible effects primarily result from the use or destruction of a specific resource such as energy and minerals that cannot be replaced within a reasonable time frame. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action, such as extinction of a threatened or endangered species or the disturbance of a cultural site.

Proposed and Alternative Actions

For the Proposed Action and Alternatives, most resource commitments are neither irreversible nor irretrievable.

Impacts to threatened and endangered species are not anticipated due to surveying and monitoring efforts developed under the proposed management requirements and immediate retrieval of the B61 JTA. Additionally, there would be no significant impact to any species population, essential fish habitat, or commercial fishery. As such, this action is not expected to significantly decrease the availability of these resources.

5. PLAN, PERMIT, AND MANAGEMENT REQUIREMENTS

The following is a list of the plan, permit, and management requirements associated with the Proposed Action. The need for these requirements were identified by the environmental analysis process in this Environmental Assessment, and were developed through cooperation between the proponent and interested parties involved in the Proposed Action. These requirements are, therefore, to be considered as part of the Proposed Action and would be implemented through the Proposed Action's initiation.

Plans

A flight plan will be established previous to each test event. The proponent will review the established flight plan with Eglin's Range Safety Office so that precise safety buffers and boundaries may be set.

Permits

Construction of the concrete pad target will require a National Pollutant Discharge Elimination System (NPDES) Permit from the Florida Department of Environmental Protection (FDEP). Phase II of this permit regulates small construction activities (disturbing between 1 and 5 acres of land) that will increase impervious surface areas and stormwater runoff.

New concrete pad construction requires stormwater regulations for new impervious surfaces, Chapter 62-25, Florida Administrative Code (F.A.C.) to be satisfied. The project may be exempt from the regulations under 62-25 F.A.C. if design is such that the swale exemption criteria is met under 62-25.030 (1)(c) F.A.C.

Management Requirements

A Notice to Airmen (NOTAM) and Notice to Mariners (NOTMAR) will be issued approximately one week before the test.

The EGTTR target areas will be monitored during the drop for sea turtles and marine mammals. The B61 JTA will be retrieved immediately following the drop.

In the unlikely event that test failure occurs and the DU or neutron generator is compromised, the proponent should be prepared to fund immediate remediation.

The proponent must call the Public Affairs office (AAC/PA) 882-3931 forty-eight hours in advance of supersonic tests so that they can notify the media and other outlets that reach the local public.

Restricted Access

All closures in the Gulf will be coordinated with Eglin's Range Safety Office.

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6. LIST OF PREPARERS

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APPENDIX A

SENSITIVE SPECIES

SENSITIVE SPECIES

Red-cockaded Woodpecker (*Picoides borealis*)

On Eglin, the red-cockaded woodpecker (RCW) typically inhabits mature, open stands of longleaf pine. The RCW does not migrate and maintains year-round territories near nesting and roosting trees (Hooper et al., 1980). Studies by DeLotelle et al. (1987) in central Florida found that RCWs foraged primarily in longleaf pine and pond cypress stands with dense ground cover of broomsedge bluestem (*Andropogon virginicus*). The birds will abandon nest cavities when the understory reaches the height of the cavity entrance.

An RCW cluster typically encompasses about 10 acres with most cavity trees likely within a 1,500-foot diameter circle. The RCW has shown some preference for mature longleaf pine over other pine species as a cavity tree with the average age of longleaf pines in which new cavities have been excavated being 95 years. Cavity excavation may take several years and may be utilized by generations of birds for more than 50 years (Jackson et al., 1979).

The woodpeckers primarily feed on spiders, ants, cockroaches, centipedes, and insect eggs and larvae that are excavated from trees. Dead, dying, and lightning-damaged trees that are infested with insects are a preferred feeding source. The birds also feed on the fruits of black cherry (*Prunus serotina*), southern bayberry (*Myrica cerifera*), and black tupelo (*Nyssa sylvatica*) (Baker, 1974).

High-quality RCW forage habitat consists of open pine stands with tree dbh (diameter at breast height) averaging 9 inches and larger. The birds forage in intermediate-aged (30-year-old) and older pine stands, which also provide an important source of future trees for the construction of cavities (U.S. Air Force, 1995). While 100 acres of mature pine is sufficient for some groups, clans commonly forage over several hundred acres where habitat conditions are not ideal (Jackson et al., 1979). The greatest threat to the RCW populations is loss and fragmentation of their habitat. As a result of active management, RCW populations on Eglin have continued to increase, with the number of active clusters growing from an estimated 217 in 1994 to 313 in 2003 (Moranz and Hardesty, 1998; Miller, 2004).

Eglin's RCW population is considered to be fastest growing large population in the country. The U.S. Fish and Wildlife Service (USFWS) has identified Eglin AFB in the RCW Recovery Plan as 1 of 13 designated primary core populations. The USFWS has determined that recovery of the Eglin AFB RCW population will consist of 350 breeding pairs of adult birds. To achieve recovery on Eglin AFB, natural resource managers at Jackson Guard have designated the portion of the Eglin Reservation needed to achieve this recovery goal as the RCW Management Emphasis Area (MEA) (U.S. Air Force, 2002). This MEA represents the minimal amount of suitable foraging area needed to achieve 350 breeding pairs of RCW in the shortest period of time. In addition to the 350 MEA, the Eglin Commander approved the *Eglin Air Force Base Integrated Natural Resources Management Plan* (U.S. Air Force, 2002) goal of achieving 450 breeding pairs of RCW to maximize mission flexibility. The area needed to achieve this goal is designated as the RCW 450 MEA. Test Areas B-70 and C-52C fall within these designated MEAs; however, cleared test areas are not being managed as part of the MEA or considered as necessary to recover the species.

Southeastern American Kestrel (*Falco sparverius paulus*)

The southeastern American kestrel is a small raptor that preys upon insects during the summer and also feeds on small rodents, birds, and reptiles that are common in open grasslands. More than 30 species of birds and about 30 species of mammals are listed as prey (Mueller, 1987). Generally it lays its eggs in early to mid-April (Bent, 1962). The birds search for prey from high perches along the forest edge or hover over open areas with short, sparse vegetation (USDA, 1991). There have been numerous sightings of the kestrel throughout the Eglin Reservation.

The kestrels occupy nearly all Grassland/Shrubland, Sandhills, and other forested community types. Habitat requirements include adequate prey, perch sites, and nesting sites. They mostly inhabit open forests and clearing edges with snags. The thick understory and midstory in Sandhills communities that are cut or are not burned may have an adverse effect on kestrel populations. Prescribed burning can be beneficial since it enhances habitat and increases the prey base (Hoffman and Collopy, 1988).

Nests are normally located along the forest edge and may be used for several years. The kestrels prefer to nest in snags and tight-fitting live tree cavities created by other birds (USDA, 1991). The birds most frequently locate their nests in abandoned red-cockaded woodpecker and other woodpecker holes in longleaf pine 12 to 35 feet above the ground. Natural cavities and snags in turkey oaks and live oaks may also be used as nesting sites (Hoffman and Collopy, 1987). The kestrels are quite tolerant of human activity around their nests. They are frequently flushed or caught at the nest without desertion.

Florida Burrowing Owl (*Athene cunicularia floridana*)

Florida burrowing owls are found in the Open Grassland/Shrubland ecological association, and a population is present on TA B-70, where owls benefit from prairie-like grassland habitat created by maintenance of the grass grid and frequent, mission-related fires. This species is not federally listed, but is protected under the federal Migratory Bird Treaty and is listed by the state of Florida as a species of special concern. This population may represent a western expansion of the range of the subspecies (U.S. Air Force 1995). Surveys indicate that the population is stable, suffering little from frequent mission activity on the range (Fenimore, 2003).

Eastern Indigo Snake (*Drymarchon corais couperi*)

The eastern indigo snake was granted protection by the state of Florida in 1971 and was federally listed as threatened in 1978. The overall range of *Drymarchon corais* extends from the southeastern United States coastal plain to northern Argentina. Only the subspecies eastern indigo (*Drymarchon corais couperi*) and Texas indigo (*Drymarchon corais erebennus*) occur within the United States.

The eastern indigo snake is the largest nonvenomous snake in North America and can grow up to 125 inches in length. The snake is a meat-eater (carnivorous) and will eat any animal up to about the size of a squirrel. The snake frequents flatwoods, hammocks, stream bottoms, canebrakes, riparian thickets, and high ground with deep, well-drained to excessively drained, sandy soils.

Habitat preferences vary seasonally. Pine sandhill winter dens are used from December to April, summer territories are selected from May to July, and from August through November indigo snakes are frequently located in shady creek bottoms. These seasonal changes in habitat encourage the maintenance of travel corridors that link these different habitat types (Hallam et al., 1998).

The federally threatened eastern indigo snake is strongly associated with gopher tortoise burrows. In Georgia, 92 percent of the indigo snakes identified during the study were located in gopher tortoise burrows (Diemer and Speake, 1983). They use abandoned burrows in winter and spring for egg laying, shedding, and protection from dehydration and temperature extremes. Indigo snakes are even known to use tortoise burrows with collapsed entrances by creating a small entrance. They also use stump holes, armadillo and gopher holes, and other wildlife ground cavities.

The primary reason for its listing as federally threatened is population declines resulting from habitat loss and fragmentation (Moler, 1987). Movement along travel corridors between seasonal habitats also exposes the snake to danger from increased contact with humans. From 1978 to 1999, Jackson Guard reported the sighting of 18 indigo snakes throughout the Eglin Mainland Reservation, based on Florida Natural Areas Inventory (FNAI) element occurrences and incidental sightings (U.S. Air Force, 2000). Many of these snakes were seen while crossing roads or after being killed by vehicles.

The AAC/EMSN primarily conducts passive management for the indigo snake by maintaining suitable habitat conditions. This includes the frequent use of fire over large portions of Eglin's sandhills. The closure of forest roads and the use of perimeter access control also benefit indigo snakes by reducing the frequency of accidental motor vehicle and indigo snake contacts. Additionally, the management and recovery of the eastern indigo snake is closely linked to the gopher tortoise. Management activities that benefit gopher tortoises benefit the indigo snake as well.

Flatwoods Salamander (*Ambystoma cingulatum*)

The flatwoods salamander is a small mole salamander about 5 inches in length when fully mature (Federal Register, 1999). Habitat for the flatwoods salamander consists mainly of open, mesic (moderate moisture) woodland of longleaf/slash pine flatwoods maintained by frequent fires. Adult flatwoods salamanders breed during the rainy season from October to December (Palis, 1997). Their breeding sites are isolated flatwoods depressions that dry completely on a cyclic basis and are generally shallow and relatively small. Since the salamander may disperse over long distances to and from breeding sites to upland sites where they live as adults, desiccation (drying out) can be a limiting factor in their movements. As a result, it is important that areas connecting their wetland and terrestrial habitats are protected to provide cover and appropriate moisture regimes during their migration.

Dusky Gopher Frog (*Rana capito sevosa*)

Eglin AFB supports the largest known concentration of reproductive sites of the dusky gopher frog subspecies anywhere within its range. This species utilizes gopher tortoise burrows for cover but will also use old field mouse burrows, hollow stumps, and other holes. They have been found in Sandhills, Sand Pine, and Open Grassland/Shrubland ecological associations up to 2 kilometers

from breeding ponds. For breeding, the species requires seasonally flooded grassy ponds, depression marshes, or upland sandhills lakes that lack fish populations (U.S. Air Force, 1995). Potential gopher frog habitat is located on TAs B-70 and C-52C. Bull Pond on TA B-70 is a confirmed gopher frog breeding wetland.

Florida Bog Frog (*Rana okaloosae*)

The Florida bog frog (*Rana okaloosae*), a small yellow-green frog, was first discovered in 1982 and is listed by the state of Florida as a species of special concern. The entire global distribution of this species lies within Walton, Okaloosa, and Santa Rosa counties, with the only known sites found on Eglin AFB and three locations to the north of the base. The species' restricted distribution may be due to characteristics of the area's streams and soil. All known locations are small tributary streams to the Yellow, Shoal, or East Bay rivers on Eglin AFB or International Paper's lands.

The Florida bog frog utilizes clear, shallow, acid seeps and shallow, boggy overflows of larger seepage streams. It is often associated with sphagnum moss. Habitat for this species is maintained by fire, which controls hardwood encroachment, increases herbaceous species, and maintains soil moisture by reducing hardwood evapotranspiration. This frog relies on the natural, constant hydrological conditions in streams where larvae develop. Breeding takes place from April until August with tadpoles transforming the following spring and summer. Bog frogs have been documented adjacent to Live Oak Creek on B-70.

Okaloosa Darter (*Etheostoma okaloosae*)

Worldwide, the Okaloosa darter is found in only six small Choctawhatchee Bay Basin tributaries located in the Sandhills ecological association of the Eglin Mainland Reservation. The darter's diet consists primarily of immature aquatic insect larvae. Spawning occurs from March to October, with the greatest amount of activity taking place during April. The spawning occurs in beds of clean, current swept macrophytes (large aquatic plants). Okaloosa darter habitat is sensitive to a variety of disturbances. Erosion can increase siltation and imperil the darter's habitat. Its range has also been reduced by habitat modification and encroachment by the brown darter. In order to protect the Okaloosa darter, the quantity and quality of water in the streams must be protected (USFWS, 1998). Okaloosa darters have been documented in Long Creek, which begins at the southwest edge of Test Area C-52C. The darter has also been found in Hickory Branch and Schoolhouse Creek, which are located to the west of TA C-52C.

Florida Pine Snake (*Pituophis melanoleucus*)

The Florida pine snake is typically found in Sandhill sandy soil areas occurring primarily in longleaf pine/turkey oak forests. Home ranges have been reported to vary from 3 to 68 acres. The snakes primarily feed on small mammals, birds and their eggs, lizards, other snakes and their eggs, and insects. The snake burrows to a depth of 9 to 12 inches in exposed loosely packed sandy soils for nesting, winter hibernation, and escape. Nest clearings average 166 feet long and 260 feet wide on slopes of less than 14 degrees. As with the eastern indigo snake, the pine snake is known to use active and inactive gopher tortoise burrows.

Gopher Tortoise (*Gopherus polyphemus*)

The gopher tortoise is a Species of Special Concern in Florida. The gopher tortoise is found primarily within the longleaf pine habitat of the Sandhills (U.S. Air Force, 1995). They also seem to have a strong affinity for open, dry, uplands of many test areas. Gopher tortoises construct burrows that are frequently located in areas with low-growing plants and sandy, well-drained soils in open, sunny areas with bare patches of ground. In the sandy soils of Eglin, the self-excavated gopher tortoise burrows are estimated to be between 14 to 20 feet long and 6 to 18 feet below the surface. The burrows remain at fairly constant temperature and humidity throughout the year, acting as a refuge from cold, heat, and dryness. They also act as a refuge from periodic fires that occur in this dry habitat. One tortoise may maintain two to three burrows within its home range.

The tortoise primarily eats grasses, leaves, fruits, seeds, and insects. The foods most frequently found in their diets are grasses (*Poaceae* spp.) and legume fruits (*Fabaceae* spp.). Female tortoises lay 3 to 15 eggs in the sand in front of their burrows during late April and May. These eggs incubate for up to 100 days. Predators such as raccoons, coyotes, and snakes often destroy more than 80 percent of gopher tortoise nests, resulting in a very low hatching success rate (Puckett and Franz, 1991).

The gopher tortoise is considered a keystone species. A keystone species is a species whose presence is ecologically significant to the survival of other species within its environment. Over 300 animals utilize the tortoise burrows; the tortoises disperse seeds while foraging; and their burrowing behavior turns over nutrients in the soil. Many associate species use or are dependent on tortoise burrows for seasonal or year-round dens, daytime retreats, nesting sites, food sources, and/or escape cover (Wilson et al., 1997). On Eglin, dusky gopher frogs and eastern indigo snakes use this critical habitat for cover.

Many inactive burrows are found on Eglin; the number of active burrows is considerably less. Gopher tortoises have been documented on TAs B-70 and C-52C. The rising number of inactive burrows has led to concerns about a population decline of the species due to poaching and loss of fire-dependent habitat (U.S. Air Force, 1995). Test area vegetation maintenance promotes the growth of preferred grass and forb food sources and high sunlight penetration, which is needed to attain minimum thermal requirements for daily activities (Mushinsky and McCoy, 1994). Thousands of acres of gopher tortoise habitat have been restored on Eglin AFB through prescribed burning.

Florida Black Bear (*Ursus americanus floridanus*)

The Florida black bear is listed as threatened by the state of Florida. It has been sighted throughout Eglin AFB. The population on Eglin AFB is Florida's fifth largest population of the subspecies. The bears are known to utilize forested flatwoods, swamp, and riparian areas for habitat. The exact locations of the bears are considered sensitive information because of the threat of poaching. Population numbers have been affected by fatal traffic collisions and destruction of habitat by encroaching development.

Sensitive Plant Species

- **Ashe's magnolia**, a state endangered species, is a large flowering tree found in steephead ravines of the Sandhills ecological association.
- **Orange azaleas**, listed by the state as endangered, are small flowering shrubs found in the slope forest communities of the Sandhills ecological association.
- **Baltzell's sedge**, a state threatened species, is a grass-like sedge that occurs in the Sandhills ecological association in upland and mixed hardwood forest plant communities in shaded undisturbed slopes of steephead ravines.
- The steephead baygall or the **Florida anise** baygall is generally restricted to the bottom of steepheads at the origin or along the stream margins.
- The **Pineland Hoary Pea**, an herbaceous plant, is a threatened species in the state of Florida. This species is found within the upland pine forest community within the Sandhills ecological association. The range of this species is restricted to Santa Rosa, Okaloosa, and Walton counties.
- The **Pineland wild indigo** is an herbaceous pea plant that can be found in the Sandhills and Sand Pine ecological associations in areas with an open canopy and sandy soils. The range of this species is restricted to Santa Rosa, Okaloosa, and Walton counties.
- The **red-flowered pitcher plant,** also known as the sweet pitcher plant, is listed as endangered by the state of Florida. This species feeds on insects and is found in shrub bogs, wet prairies, wet flatwoods, and baygall communities throughout Eglin.
- The Sandhills ecological association is home to **silky camellia**, a Florida endangered species**.** It is found along steephead ravines and in slope forests on Eglin AFB.
- The **karst pond yellow-eyed grass** lives in Sandhill areas with upland lakes and in depression marshes.
- **Mountain laurel** is a state-listed threatened species and inhabits the Sandhills ecological association. It is found in underbrush of slope forests.
- **Bog buttons** is a small species that inhabits wet areas like seepage slopes, bogs, edges of baygalls, and drainages.
- The **panhandle lily**, a state-listed endangered species, inhabits streamside baygalls organic soil. Factors influencing its status include drainage and field collecting.
- **Pyramid magnolia**, a state endangered species, is found on Eglin in the Sandhills region. Underbrush of slope forest provides resources needed for this plant to thrive.
- **Naked-stemmed panic grass** is found in fire-maintained wet, sticky, organic soil associated with seepage slopes and bogs.

Toothed Whales and Dolphins

Atlantic bottlenose dolphins (*Tursiops truncatus*) occur in slope, shelf, and inshore waters of the Gulf. The average herd or group size of Atlantic bottlenose dolphins in shelf waters was approximately four individuals per herd as determined by GulfCet II surveys of eastern Gulf waters (Davis et al., 2000). The diet of Atlantic bottlenose dolphins consists mainly of fish, crabs, squid, and shrimp (Caldwell and Caldwell, 1983).

Atlantic spotted dolphins (*Stenella frontalis*) can attain lengths of up to 8 feet at adulthood. Their distribution in the Atlantic ranges from the latitude of Cape May, New Jersey, along mainland shores to Venezuela, including the Gulf of Mexico and Lesser Antilles (Caldwell and Caldwell, 1983). The diet of the Atlantic spotted dolphin consists of squid and fish.

Gulf Sturgeon

The USFWS and NMFS designated the Gulf sturgeon (*Acipenser oxyrhynchus desotoi*) as threatened under the ESA; listing became official on 30 September 1991. The Gulf sturgeon occurs predominately in the northeastern Gulf of Mexico, feeding in offshore areas and inland bays during the winter months and moving into freshwater rivers, such as the Yellow River and the Choctawhatchee River, to spawn during the spring and summer. Little is known about the offshore distance the Gulf sturgeon travels, but analyses of stomach contents suggest that feeding occurs as far as 20 miles offshore (Page and Burr, 1991; U.S. Coast Guard, 1996).

The final rule for Gulf sturgeon critical habitat was published in the Federal Register on 19 March 2003. "Critical habitat" is defined by the ESA as specific areas within or outside the geographical area occupied by the species that contain physical or biological features essential to the species' conservation and that may require special management considerations or protection. As pertains to the Proposed Action, critical habitat for Gulf sturgeon feeding and migration includes nearshore areas in the Gulf of Mexico up to 1 nautical mile offshore from Escambia, Santa Rosa, Okaloosa, Walton, Bay, and Gulf counties.

Sea Turtles

Four species of sea turtles may potentially be found in the waters near the Proposed Action. Of the four species protected by state and federal governments, all but the loggerhead are classified as endangered. The loggerhead is classified as threatened by both the Florida and the federal governments. The smallest species is the Kemp's ridley (75 to 100 pounds) and the largest is the leatherback (up to 2,000 pounds and 8 feet long). Sea turtles spend their lives at sea and only come ashore to nest. It is theorized that young turtles, between the time they enter the sea as hatchlings and their appearance as subadults, spend their time drifting in ocean currents among seaweed and marine debris. The population numbers of sea turtles has been gravely reduced during the twentieth century due to illegal domestic harvesting of eggs and turtles in the United States and its territories as well as other important nesting areas around the world. Sea turtles are identified in Table 3-8 according to their status of federal protection in the Gulf of Mexico. Density and abundance estimates were derived from NMFS aerial surveys (Table A-1) (Davis et al., 2000).

Table A-1. Sea Turtle Statistics from Surveys of the Continental Shelf (1996-98)

	Number Sighted	Individuals/100 km^2	Abundance Estimate
Loggerhead			
Overall	84	4.077	503
Summer	39	3.891	480
Winter	45	4.253	524
Kemp's ridley	2	0.097	12
Leatherback	4	0.194	24
Unidentified	7	0.340	42

Source: Davis et al., 2000

Manatees

The West Indian manatee (*Trichechus manatus*) is federally listed as endangered by the USFWS and also by the Florida Fish and Wildlife Conservation Commission (FWC) (Florida Game and Freshwater Fish Commission, 1994). In 1983, Florida passed a law to protect manatees, which were historically hunted for oil, meat, and leather (USFWS, 1990). In July 1978, the Florida Manatees Sanctuary Act established the entire state as a "refuge and sanctuary for the manatees" (USFWS, 1991). Manatees are herbivorous aquatic mammals; their diet consists mainly of water hyacinth, hydrilla, turtle grass (*Thalassia testidinum*), manatee grass (*Syringodium filiforme*), and shoal grass (*Haladule wrightii*) (USFWS, 1991; U.S. Coast Guard, 1996).

Manatees live in coastal regions including bays, rivers, salt marshes, seagrass meadows, and mangroves (USFWS, 1990). Although they usually occur in tropical waters, they have been sighted in northwest Florida. West Indian manatees rarely venture into deeper waters, but have been spotted as far offshore as the Dry Tortugas Islands (U.S. Coast Guard, 1996). For most of the year, they are found throughout south and central Florida, often in conjunction with sea grasses and vascular freshwater aquatic vegetation (MMS, 1990). The distributional range of the majority of West Indian manatees extends from the Suwannee River south to the Chassahowitzka River during summer and winter migrations (Rathburn et al., 1990). Incidental sightings outside of their normal range (north of the Suwannee River) and as far south as Sanibel Island have been documented (Rathburn et al., 1990). Seasonal movements result from the West Indian manatee's intolerance to cold. During cold fronts, they usually move into areas where there are warm-water refuges such as artesian springs and power-plant discharges. During the summer, their habitats are less defined as they have more freedom to move around in warmer waters and search for food (U.S. Coast Guard, 1996).

Birds

The brown pelican (*Pelecanus occidentalis carolinensis*) occurs within the coastal regions of the Gulf of Mexico and is listed as a species of special concern by the State of Florida (USFWS, 1996). The brown pelican was faced with extinction because of the widespread use of DDT and its effects on the thinning of eggshells. The population has increased since the banning of DDT in 1972 (Udvardy, 1985) and was removed from the endangered species list in 1985. Although they are coastal birds, they will sometimes travel 20 miles offshore to find feeding opportunities (Collazo and Klaas, 1986; Fritts et al., 1983).

Appendix A References

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APPENDIX B

COASTAL ZONE MANAGEMENT ACT CONSISTENCY DETERMINATION

FEDERAL AGENCY COASTAL ZONE MANAGEMENT ACT (CZMA) NEGATIVE DETERMINATION

Introduction

This document provides the State of Florida with the U.S. Air Force's Negative Determination under Section 307 of the Coastal Zone Management Act, 16 U.S.C. § 1456, and 15 C.F.R. Part 930.35. The information in this Negative Determination is provided pursuant to 15 C.F.R. Section 930.35 (b).

Proposed Federal agency action:

Air Combat Command has requested the use of Eglin Air Force Base (AFB) (Figure 1) as an alternative to the Department of Energy's (DOE) Tonopah Test Range (TTR) for conducting B61 Joint Test Assembly (JTA) Weapons Systems Evaluation Program (WSEP) flight tests. These flights are part of the DOE and Department of Defense (DoD) surveillance testing of the enduring stockpile and not a test of new weapons or weapon components. The purpose of the B61 flight test program is to test the B61 JTA in normal "stockpile-to-target sequence" (STS). Environmental conditions at Eglin will allow for testing at higher humidity levels and lower target altitudes. The goal for the test is high-speed, low- and high-altitude release on Test Area (TA) B-70 (Figure 2). The desired target will be a 90,000-ft2 (300x300) concrete pad constructed on TA B-70. Additional testing would include a shallow-water drop in the Gulf of Mexico (W-151 in <50 foot depth) (Figure 3). Some releases at B-70 would be supersonic. Shallow-water targets would be located in the EGTTR, W-151 (at <50 feet of water depth) and would not be supersonic. WSEP flight tests would include B-52 or B-2 aircraft dropping B61 JTAs, or F-15E or F-16C aircraft dropping B61 JTAs, with each test employing a "drop/watch/retrieve" sequence. The JTAs would be immediately removed after each test. For each test, one JTA will be dropped at each TA every two years beginning spring 2004.

The military has nuclear weapons in their active inventory or stockpile. These weapons are full up weapons ready for use and are called war reserve (WR) nuclear weapons. Every year a certain number of these WR nuclear weapons are randomly selected to be shipped to a DOE production facility where selected parts from those WR weapons are used to build a JTA (Figure 4). The JTAs are then flight tested to assess the performance of the WR parts Each JTA retains as many of the WR components as possible including portions of the explosive package, but **no JTA configuration is capable of providing a nuclear detonation**. The B61 has five versions divided into two families. The Mod 3, Mod 4, and Mod 10 are one family, which is delivered by tactical aircraft; the Mod 7 and Mod 11 are the other family, which is delivered by strategic bomber aircraft. Mod 11 would not be tested at Eglin. Each Mod (3/4/7/10) has different JTA configurations used to test the different B61 fusing and aircraft delivery options. JTA configurations JTA1, JTA3, JTA6, and JTA9 are applicable to testing on Eglin ranges.

The JTA1, JTA3, and JTA6 configurations contain war reserve (WR) neutron generators and depleted uranium (DU). The depleted uranium is mildly radioactive but not capable of causing a nuclear detonation. All JTA configurations also use sealed thermal batteries that contain lithium compounds and chromate/calcium compounds as well as explosive hazards. Most explosives in the JTAs are located inside the sealed center case section (the center case is a 0.52-inch-thick hard aluminum extrusion for the Mods 3/4/7/10) and are inaccessible during or after a normal test and would present no hazard. **The explosives outside the center case section are accessible, however none of the JTA configurations planned to be tested at Eglin AFB ranges would contain Insensitive High Explosives (IHE) (all weapons to be tested at Eglin are inert).**

The B61 JTA center section has never split or broke open even with ground impacts of 1100 fps (feet per second) into Tonopah Testing Range's dry lake bed (hard packed clay) (Sandia National Laboratories, 2003). Therefore, this CZMA analysis concentrates on normal testing scenarios.

All other explosives and hazardous materials contained in the B61 JTA are classified Secret Restrictive Data (SRD) and for security purposes cannot be identified or discussed in detail.

Federal Consistency Review

After review of the Florida Coastal Management Program and its enforceable policies, the U.S. Air Force has made a negative determination that this activity will have any affect on the state of Florida's coastal zone or its resources.

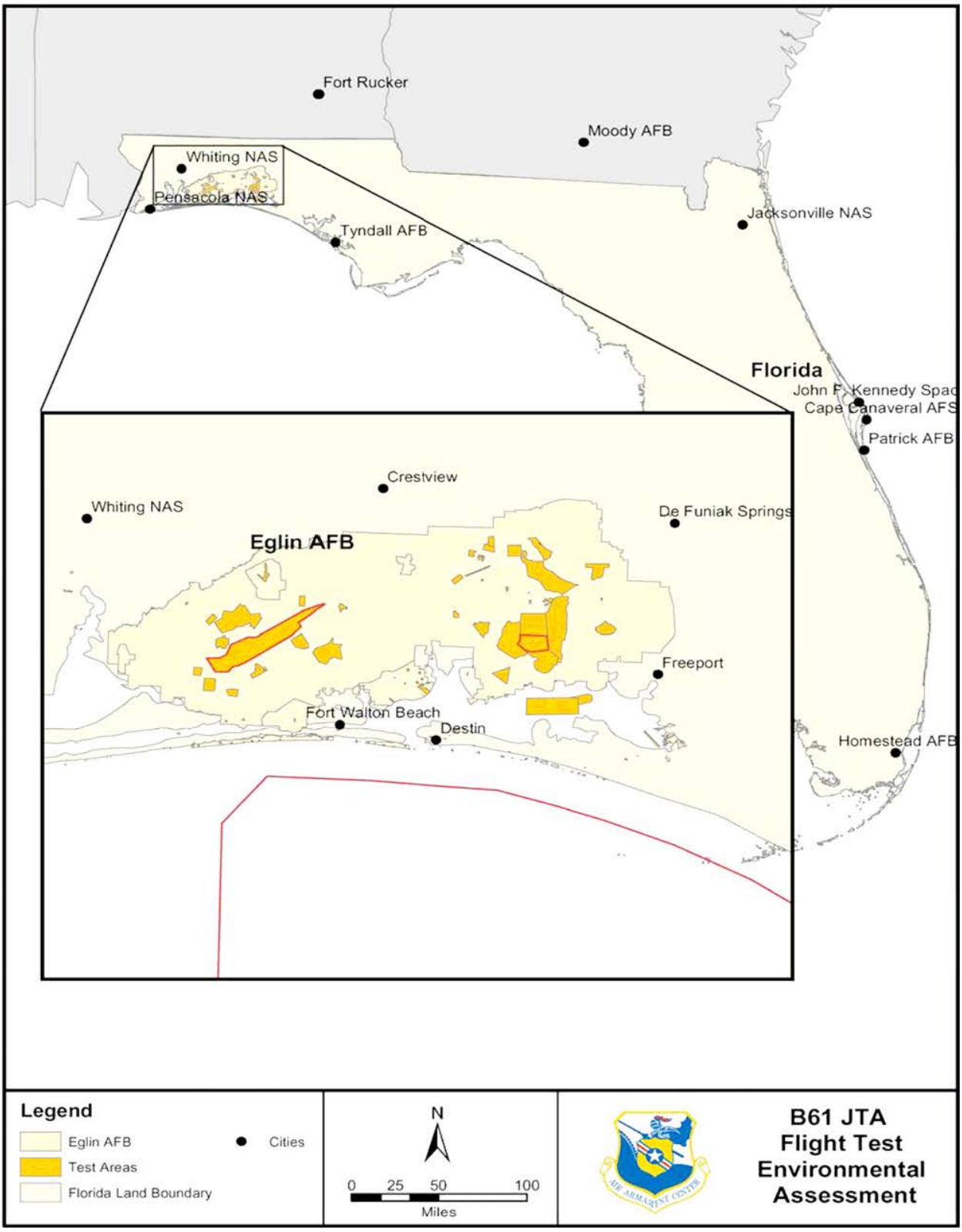

Figure 1. Eglin Air Force Base, FL

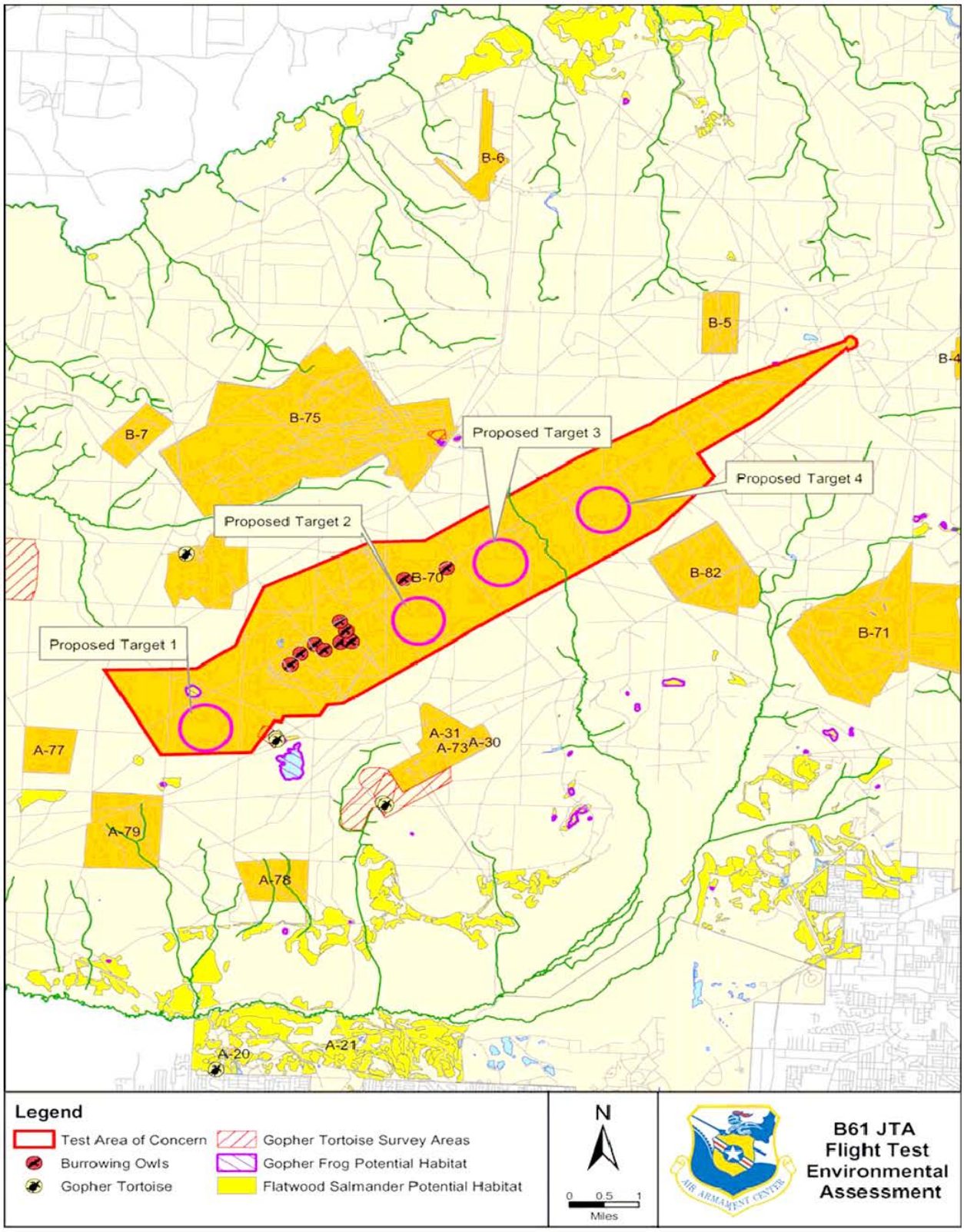

Figure 2. Proposed Target Areas at B-70

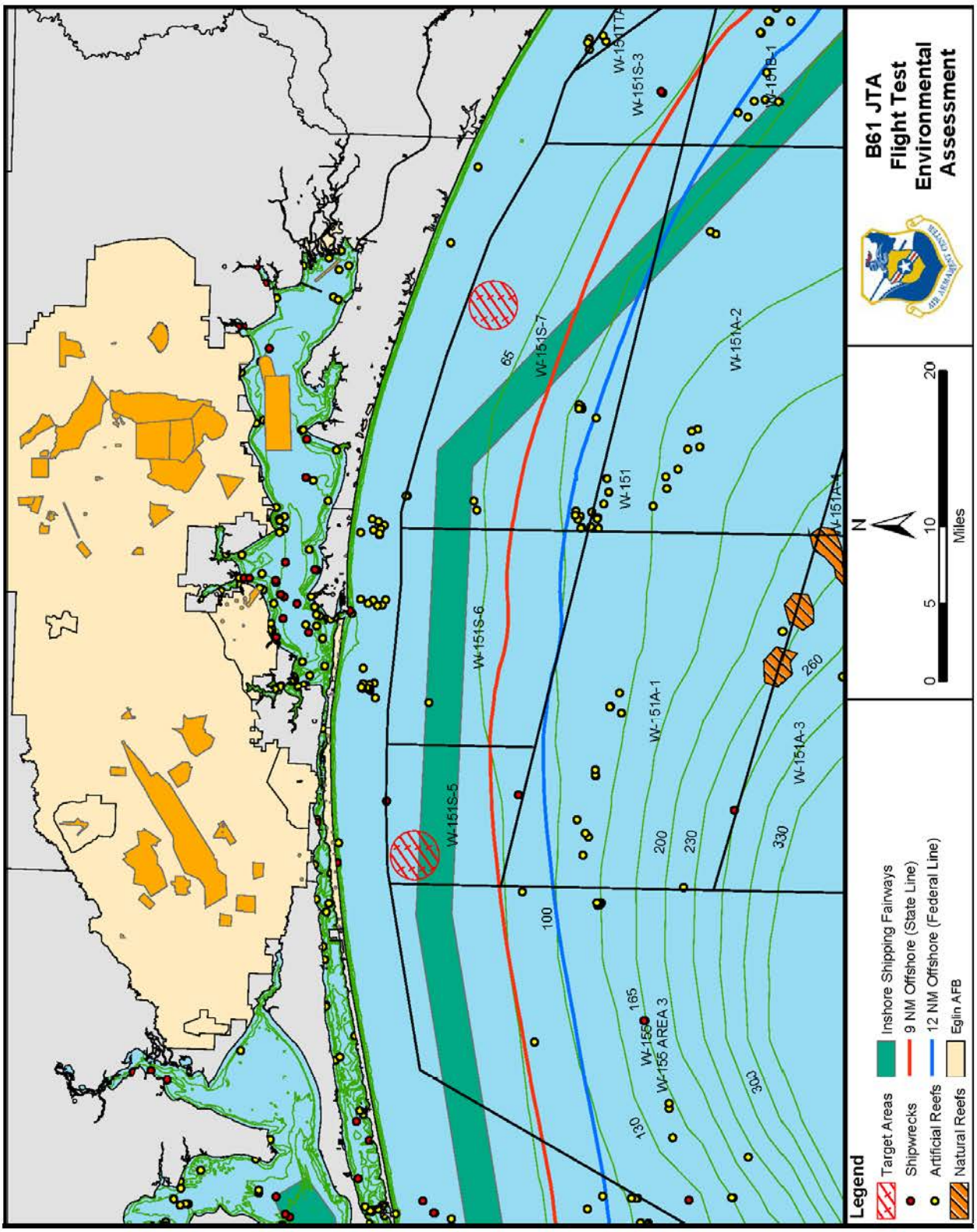

Figure 3. Proposed Target Areas at W-151

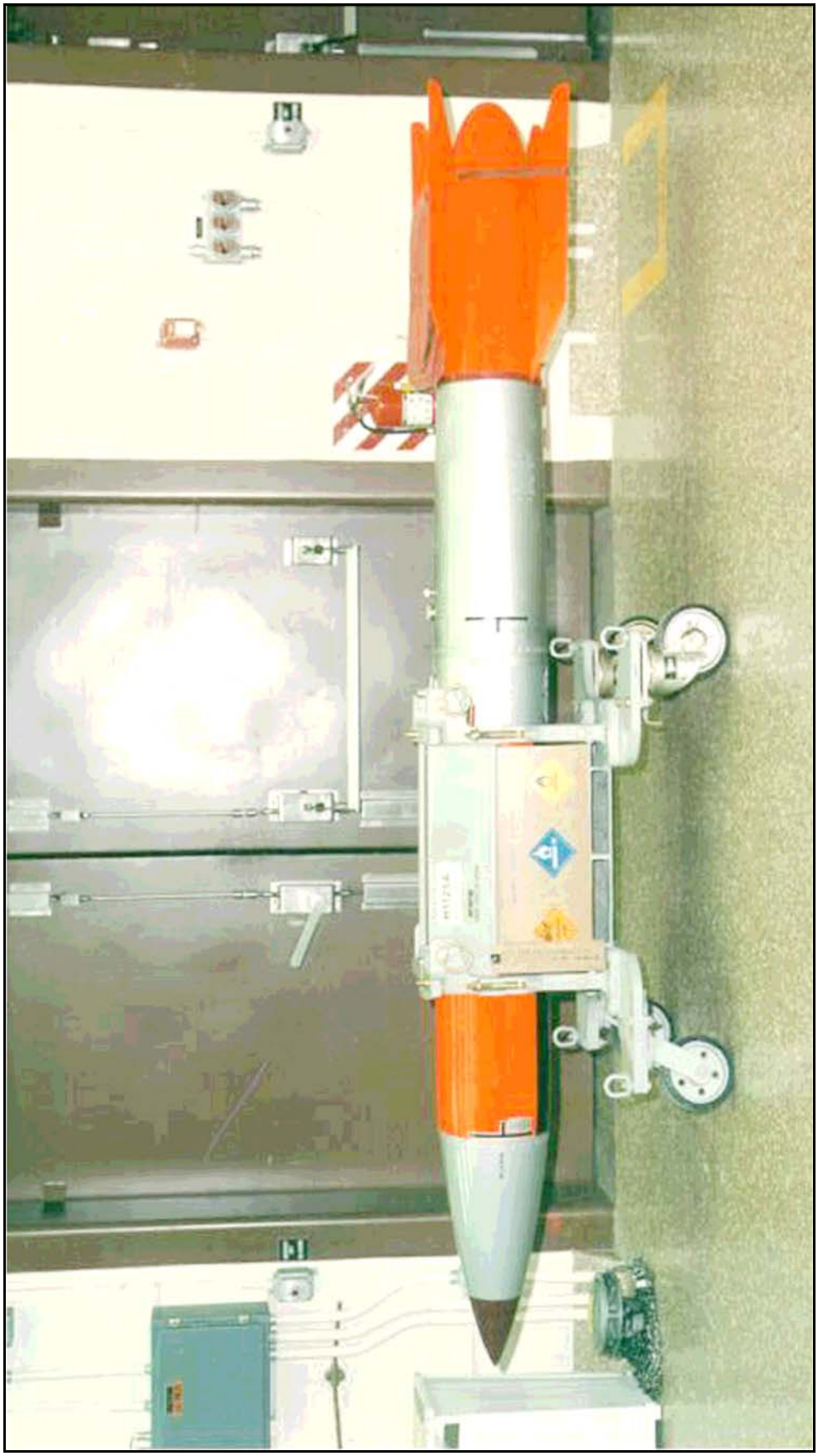

Figure 4. B61 JTA WSEP

Florida Coastal Management Program Consistency Review

Statute	Consistency	Scope
Chapter 161 *Beach and Shore Preservation*	The proposed project would not affect beach and shore management, specifically as it pertains to: -The Coastal Construction Permit Program. -The Coastal Construction Control Line (CCCL) Permit Program. -The Coastal Zone Protection Program. All land activities would occur on federal property.	Authorizes the Bureau of Beaches and Coastal Systems within Department of Environmental Protection (DEP) to regulate construction on or seaward of the states' beaches.
Chapter 163, Part II *Growth Policy; County and Municipal Planning; Land Development Regulation*	The proposed action will occur primarily on federal property. The testing of the B61 JTA at W-151 will not have an affect on local government comprehensive plans.	Requires local governments to prepare, adopt, and implement comprehensive plans that encourage the most appropriate use of land and natural resources in a manner consistent with the public interest.
Chapter 186 *State and Regional Planning*	The proposed action will occur primarily on federal property. The testing of the B61 JTA at W-151 will not have an affect on state and regional planning.	Details state-level planning requirements. Requires the development of special statewide plans governing water use, land development, and transportation.
Chapter 252 *Emergency Management*	The proposed action would not increase the state's vulnerability to natural disasters. Emergency response and evacuation procedures would not be impacted by the proposed action.	Provides for planning and implementation of the state's response to, efforts to recover from, and the mitigation of natural and manmade disasters.
Chapter 253 *State Lands*	The proposed action will occur primarily on federal property. The testing of the B61 JTA at W-151 does involve the use of state waters; however, the testing will not have an affect on the acquisition of land in order to conserve and protect environmentally endangered lands.	Addresses the state's administration of public lands and property of this state and provides direction regarding the acquisition, disposal, and management of all state lands.
Chapter 258 *State Parks and Preserves*	State parks, recreational areas and aquatic preserves would not be affected by the proposed action.	Addresses administration and management of state parks and preserves (Chapter 258).
Chapter 259 *Land Acquisition for Conservation or Recreation*	The proposed action would not have an affect on the acquisition of environmentally endangered lands and outdoor recreations lands.	Authorizes acquisition of environmentally endangered lands and outdoor recreation lands.
Chapter 260 *Recreational Trails System*	The proposed action would not have an affect on acquisition of land to create a recreational trails system.	Authorizes acquisition of land to create a recreational trails system and to facilitate management of the system.

Florida Coastal Management Program Consistency Review Cont'd

Chapter 375 *Multipurpose Outdoor Recreation; Land Acquisition Management, and Conservation*	Opportunities for recreation on state lands would not be significantly decreased, as restrictions to airspace and the Gulf of Mexico would be brief and temporary.	Develops a comprehensive multipurpose outdoor recreation plan to document recreational supply and demand, describe current recreational opportunities, estimate need for additional recreational opportunities, and propose means to meet the identified needs.
Chapter 267 *Historical Resources*	The proposed action would not have an affect on cultural resources. There are no documented resources on TA B-70. Target areas at W-151 have been established to avoid any cultural resources.	Addresses management and preservation of the state's archaeological and historical resources.
Chapter 288 *Commercial Development and Capital Improvements*	The proposed action occurs primarily on federal property. The proposed action is not anticipated to have any effect on future business opportunities on state lands. Access to recreational and commercial fishing/diving may be restricted. Shipping routes for waterborne craft may be temporarily closed. Public access restrictions will be temporary in W-151 and are not likely to impact tourism in the region.	Provides the framework for promoting and developing the general business, trade, and tourism components of the state economy.
Chapter 334 *Transportation Administration* Chapter 339 *Transportation Finance and Planning*	The proposed action would not affect the transportation administration of the state. The proposed action would not affect the finance and planning needs of the state's transportation system.	Addresses the state's policy concerning transportation administration (Chapter 334). Addresses the finance and planning needs of the state's transportation system (Chapter 339).
Chapter 370 *Saltwater Fisheries*	The proposed action is not likely to affect saltwater fisheries. Commercial fishing vessels and all other watercraft would be restricted from the target areas in W-151 during the mission. A Notice to Mariners will be issued prior to closure of the area.	Addresses management and protection of the state's saltwater fisheries.
Chapter 372 *Wildlife*	The proposed action is not anticipated to affect wildlife resources. Effects from supersonic noise to sensitive species are not anticipated to be harmful because of the infrequency of the test and the brief exposure time. Additionally, the boom carpets generated by supersonic flight overlap with the habitats of both burrowing owls and red-cockaded woodpeckers. Because the burrowing owls are located on the test area (B-70), they have been exposed to the boom carpet during past supersonic missions. The burrowing owls continue to nest successfully on Test Area B-70 despite the noise from sonic booms, as well as other disturbances, such as detonations. No significant impacts to burrowing owls are anticipated from the sonic boom.	Addresses the management of the wildlife resources of the state.

Florida Coastal Management Program Consistency Review Cont'd

	The red-cockaded woodpecker (RCW) is also nesting successfully in close proximity to TA B-70. There is other suitable habitat available, but the RCWs have remained near the test area. Like the burrowing owl, suitable habitat appears to outweigh any negative influences associated with supersonic booms.	
Chapter 373 *Water Resources*	The proposed action is not likely to affect water resources. Streams on B-70 are outside of the target area footprints. The B61 JTA spin rocket and motor would produce explosive by-products that may enter Gulf waters; these amounts are minimal and would not produce adverse environmental impacts. The B61 would be immediately retrieved upon entering the Gulf of Mexico, and the DU and neutron generator will remain intact. Therefore, no impacts from the DU and the neutron generator would ensue.	Addresses the state's policy concerning water resources.
Chapter 376 *Pollutant Discharge Prevention and Removal*	The DU would not be expended, and will not affect the environment at B-70 and W-151. Firing of the spin rocket and gas generator may contaminate post-test B61 JTAs with explosive by-products. Most explosives and hazardous materials are located inside sealed center case section and are not accessible during or after a normal test, presenting no hazards.	Regulates transfer, storage, and transportation of pollutants, and cleanup of pollutant discharges.
Chapter 377 *Energy Resources*	Energy resource production, including oil and gas, and the transportation of oil and gas, would not be affected by the proposed action.	Addresses regulation, planning, and development of energy resources of the state.
Chapter 380 *Land and Water Management*	The proposed action would primarily occur on federally owned lands. Under the proposed action, development of state lands with regional (i.e., more than one county) impacts would not occur. Areas of Critical State Concern or areas with approved state resource management plans such as the Northwest Florida Coast would not be affected. Changes to coastal infrastructure such as bridge construction, capacity increases of existing coastal infrastructure, or use of state funds for infrastructure planning, designing or construction would not occur.	Establishes land and water management policies to guide and coordinate local decisions relating to growth and development.
Chapter 381 *Public Health, General Provisions*	The proposed action does not involve the construction of an on-site sewage treatment and disposal system.	Establishes public policy concerning the state's public health system.
Chapter 388 *Mosquito Control*	The proposed action would not affect mosquito control efforts.	Addresses mosquito control effort in the state.

Florida Coastal Management Program Consistency Review Cont'd

Chapter 403 *Environmental Control*	The proposed action would not have an affect on air quality criteria. Combustive fugitive dust emission from the concrete pad construction on B-70 would not exceed air quality criteria. Potential for discharges into surrounding waters are minimal. A National Pollutant Discharge Elimination Permit (NPDES) is required, as approximately 2 acres of soil would be disturbed to construct the 90,000-ft2 pad. Additionally, new concrete pad construction requires stormwater regulations for new impervious surfaces, Chapter 62-25, Florida Administrative Code (F.A.C.) to be satisfied. The project may be exempt from the regulations under 62-25 F.A.C. if design is such that the swale exemption criteria is met under 62-25.030 (1)(c) F.A.C.	Establishes public policy concerning environmental control in the state.
Chapter 582 *Soil and Water Conservation*	The clearing of land for construction and demolition of the concrete pad and any roadways needed would disturb over 2 acres of soils and subsequently provide opportunities for erosion. To minimize soil runoff at the construction site, best management practices (BMPs) typically used for construction projects on Eglin, would be employed to eliminate impacts. Each target site at B-70 has a large buffer zone radiating from the proposed area for the concrete pad. No streams or surface waters are located in this buffer zone, which decreases the likelihood for erosion and sedimentation.	Provides for the control and prevention of soil erosion.

-----Original Message-----
From: Milligan, Lauren [mailto:Lauren.Milligan@dep.state.fl.us]
Sent: Wednesday, May 12, 2004 2:18 PM
To: Poirier Jennifer M Contr AAC/EMSN
Cc: Lawson, Daniel; Bob Miller (E-mail)
Subject: RE: Negative Determination B61 JTA WSEP

Ms. Jennifer Poirier, Environmental Scientist
Eglin AFB - Natural Resources Branch
107 Highway 85 North
Niceville, FL 32578

RE: Department of the Air Force - Negative Determination - B61 Joint Test Assembly (JTA) Weapons Systems Evaluation Program (WSEP) Flight Tests - Eglin Air Force Base, Okaloosa and Santa Rosa Counties, Florida and Gulf of Mexico.

SAI # FL200405126222

Dear Jennifer:

The Florida State Clearinghouse is in receipt of your notice regarding the U.S. Air Force's proposal to conduct weapons testing at Eglin AFB Test Area B-70 and in the Gulf of Mexico. Department staff does not object to the Air Force's negative determination and agrees that the proposed action meets the requirements of 15 CFR 930.35.

Thank you for the opportunity to review this proposal. If you have any questions or need further assistance, please contact me at (850) 245-2170.

Sincerely,

Lauren P. Milligan, Environmental Consultant
Florida State Clearinghouse
Florida Department of Environmental Protection
3900 Commonwealth Blvd, Mail Station 47
Tallahassee, Florida 32399-3000
ph. (850) 245-2170
fax (850) 245-2190

-----Original Message-----
From: Poirier Jennifer M Contr AAC/EMSN
[mailto:jennifer.poirier@eglin.af.mil]
Sent: Monday, May 10, 2004 2:23 PM
To: Milligan, Lauren
Cc: Lawson, Daniel; Bob Miller (E-mail)

Ms. Lauren P. Milligan, Environmental Consultant
Florida State Clearinghouse
Florida Department of Environmental Protection
3900 Commonwealth Boulevard, Mail Station 47
Tallahassee, FL 32399-4700
Dear Lauren,
Attached is the US Air Force's proposal for the proposed testing of the B61 JTA WSEP at Eglin Air Force Base, FL. We are submitting this CZMA Negative Determination under 15 C.F.R. 930.35. Please consider a five-day review period on this project and a response via e-mail.
If you require additional information or have any questions or concerns, I can be reached at (850)882-8397.
Thank you,
Jennifer
<<B61 JTA v5.pdf>>

Jennifer Poirier
Environmental Scientist
Science Applications International Corporation (SAIC)
Eglin AFB
Natural Resources Branch
107 Highway 85 North
Niceville, FL 32578
(850) 882-8397
poirier@eglin.af.mil

APPENDIX C

PUBLIC REVIEW PROCESS

SATURDAY, MAY 29, 2004 Daily News PAGE B5

PUBLIC NOTIFICATION

In compliance with the National Environmental Policy Act, Eglin Air Force Base announces the availability of the Draft Environmental Assessment and Finding of No Significant Impact for RCS 03-180, B61 Joint Test Assembly Weapon Systems Evaluation, Eglin Air Force Base, Florida, for public review and comment.

The proposed Action includes the Air Combat Command using Eglin Air Force Base as an alternative to the Department of Energy's Tonopah Test Range for conducting B61 Joint Test Assembly Weapons Systems Evaluation Program flight tests. These flights are part of the DOE and Department of Defense surveillance testing of the enduring stockpile and not a test of new weapons or weapon components. The purpose of the B61 flight test program is to test the B61 JTA in normal stockpile-to-target sequence. Environmental conditions at Eglin will allow for testing at higher humidity levels and lower target altitudes. The goal for the test is high-speed, low and high altitude release on Test Area B-70. The desired target will be a 90,000 square foot (300'x300') concrete pad constructed on TA B-70. Additional testing would include a shallow water drop in the Gulf of Mexico (W151 in less than or equal to 50-foot depth). This drop would be a freefall air scenario and would not be supersonic and would be inert. WSEPs would include B-52 or B-2 aircraft dropping B61 JTAs and F-15E or F-16C aircraft dropping B61 JTAs, with each test employing a drop/watch/retrieve sequence. The JTAs would be immediately removed after each test. For each test, one JTA would be dropped at each TA every two years beginning Spring 2004.

Your comments on this draft EA are requested. Letters or other written or oral comments provided may be published in the Final EA. As required by law, comments will be addressed in the Final B61 JTA EA and made available to the public. Any personal information provided will be used only to identify your desire to make a statement during the public comment period or to fulfill requests for copies of the Final EA or associated documents. Private addresses will be compiled to develop a mailing list for those requesting copies of the Final EA. However, only the names and respective comments of respondent individuals will be disclosed. Personal home addresses and phone numbers will not be published in the Final EA.

Copies of the draft Environmental Assessment and Finding of No Significant Impact (FONSI) may be reviewed at the Fort Walton Beach Public Library, 185 SE Miracle Strip Pkwy, Ft. Walton Beach, FL, Destin Public Library, 150 Siebert Ave, Destin, FL, and the Niceville Library, 206 Partin Dr, Niceville, FL. Copies will be available for review from May 29, 2004 through June 12, 2004. Comments must be received by June 15, 2004.

For more information or to comment on the proposed action, contact: Mr. Mike Spaits, AAC/EM-PAV, 501 De Leon St., Suite 101, Eglin AFB, Florida 32542-5133, or email: spaitsm@eglin.af.mil. Tel: (850) 882-2878 ext 333, Fax: (850) 882-3761.

547962

Jun. 16, 2004

Public Notice Certification

RCS 03-180
B-61 JTAWSEP EA

A public notice was published in the *Northwest Florida Daily News* on May 29, 2004 to disclose completion of the Draft EA, selection of the preferred alternative, and request comments during the 15-day pre-decisional comment period.

The 15-day comment period ended on Jun. 12, 2004, with the comments required to this office not later than Jun. 15, 2004.

No comments were received during this period.

//signed//
Mike Spaits
AAC Environmental Public Affairs